DOCUMENTATION HANDBOOK

PHONTECH
SPA 1500
PUBLIC ADDRESS SYSTEM

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Public Address system
SPA 1500
System description

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TITLE: **SPA 1500 - Public Address system**
Version 05827
System description

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1 INTRODUCTION

The Phontech SPA system is a standard **S**mall **P**ublic **A**ddress system especially designed to cover the needs for PA and entertainment distribution on smaller and mid-size ships and offshore platforms.
The SPA is a very compact design, but never the less the functions are very much like those in larger familiar systems.
The customer may chose many optional functions/facilities, and thus obtain an almost tailor made PA system.

Most of the SPA systems are single systems without alarm (GA) but with entertainment included. **See figure 1** below for typical system setup.

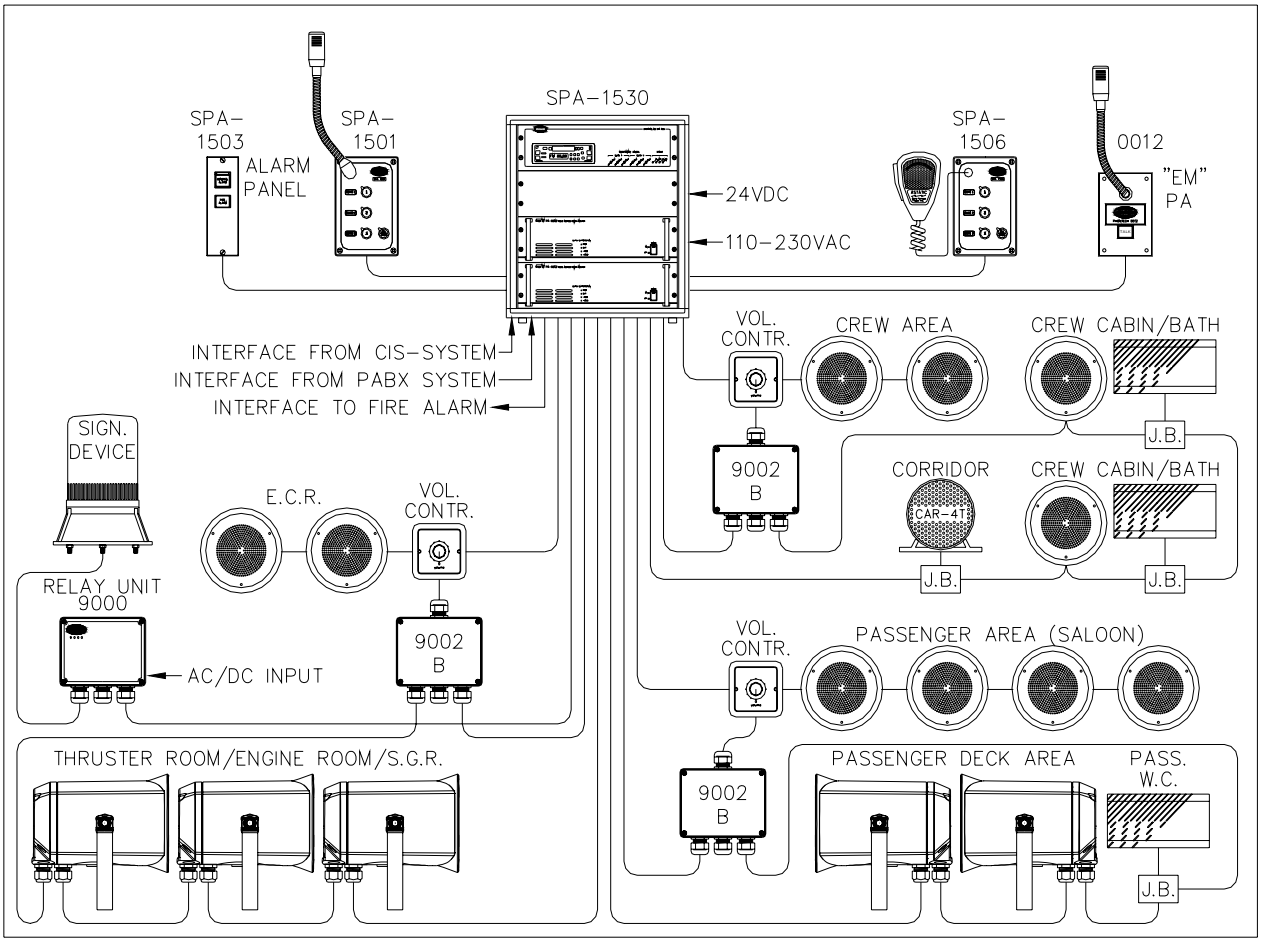
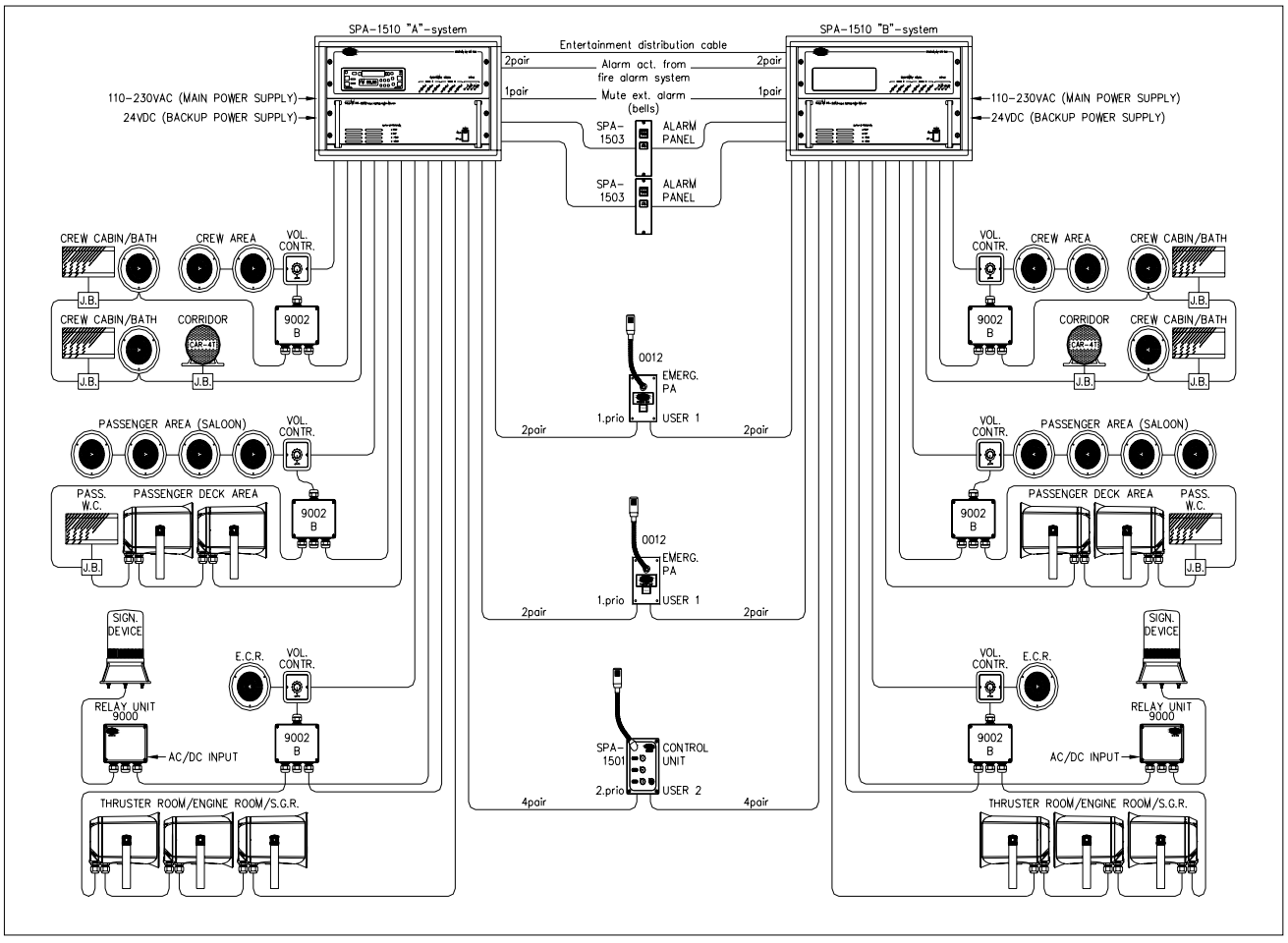


Figure 1 – Single SPA 1500 system

If the system is used as PA onboard a passenger vessel or if it is used as an integrated PA and GA, then the entire system shall be duplicated.
This means two central units SPA 1500 with amplifiers and separate routing of loudspeakers and flash lights. The duplication applies also to the field junction boxes. Operator panels will have separate routing to each SPA 1500.
<u>See figure 2</u> below for typical installation setup.

The two A and B systems needs no synchronization or other connection between them for any functions. But if entertainment source is installed this is normally installed in A-system only. Then a audio distribution cable is needed from A to B system.

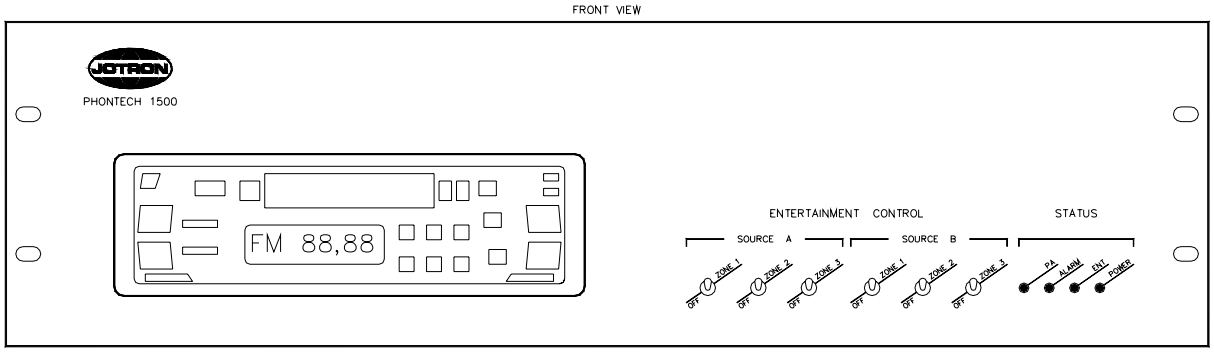


<u>Figure 2 – Duplicated SPA 1500 system</u>

2 GENERAL DESCRIPTION

2.1 Operation unit SPA 1500

The SPA 1500 is the central unit in the SPA system. The SPA 1500 contains all the necessary electronics/logic needed to obtain the functions/facilities in a PA and entertainment system. Housed in a 19" unit and with a height of 3HE (133mm)



The functions/facilities lists as follows:
- 3 user inputs.
- 1 external PA input (typical PABX line)
- 1 external entertainment audio line input.
- 1 internal entertainment audio line input.
- 1 Car radio cassette/CD player for internal entertainment source. (Option).
- 24 VDC primary power supply input.
- 110 – 240 VAC optional primary power supply input
- 24 VDC backup supply connection with automatic switching.
- 3 alarm types (externally triggered). (Option).
- 3 amplifier interfaces
- 3 zone outputs.
- Mute local loudspeaker relays for the 3 users
- Override volume control outputs for the 3 zones.
- User priority ranking.
- Attention tone (ding dong) for paging. (Optional)

STATUS INDICATOR LEDS

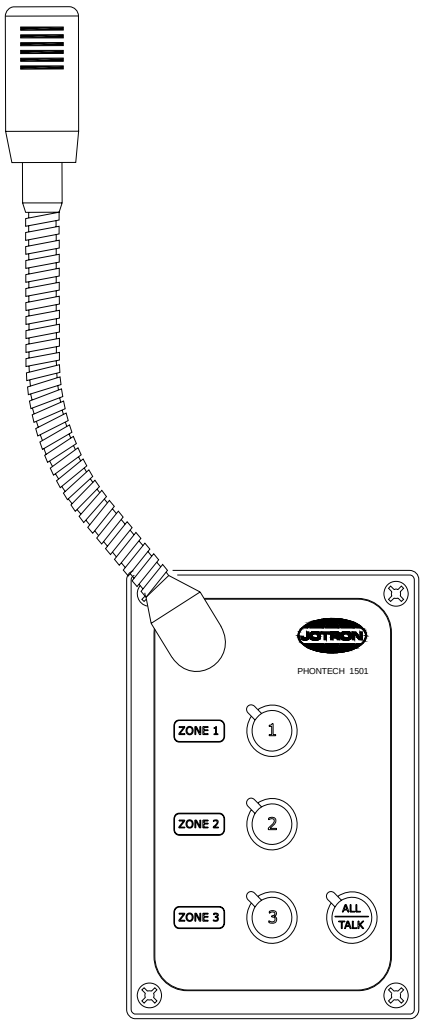
- Power on led indicator.
- Power failure led indicator.
- Alarm on led indicator.
- Entertainment on led indicator.
- PA activity led indicator.

ENTERTAINMENT CONTROL

3 toggle switches for each entertainment source.
Both sources may be distributed to any of the 3 zones.
The status led "ENT" illuminates.

2.2 PA Control unit SPA 1501

The SPA 1501 is designed especially to operate together with the SPA 1500.
The SPA 1501 is the paging station.
The SPA 1501 is flush mounted, back-box for wall mounting is available as optional.



- Gooseneck microphone as standard.
- 3 zones select buttons with light indication
- 1 talk/all buttons with light indication.
- Zone/area indicator windows with backlight.

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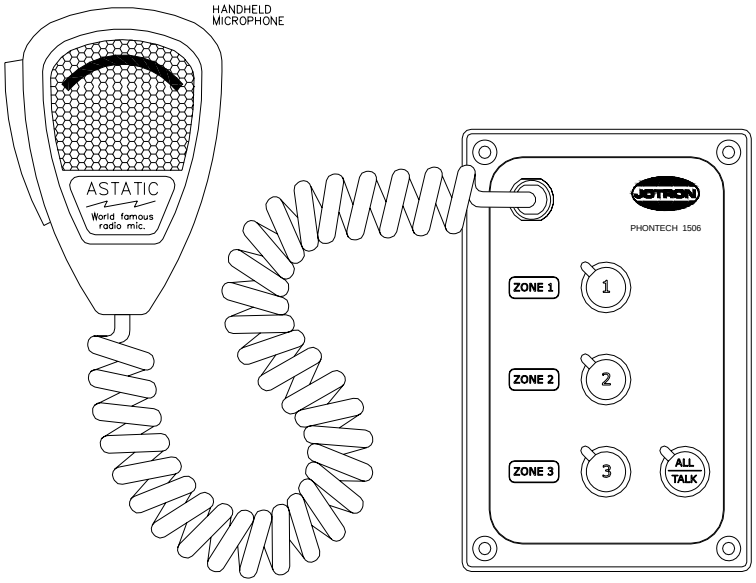
2.3 PA Control unit SPA 1506

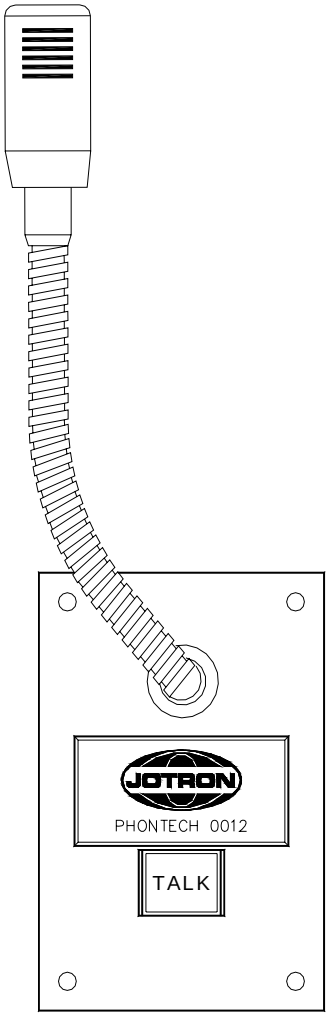
The SPA 1506 is designed especially to operate together with the SPA 1500.
The SPA 1506 is the paging station.
The SPA 1506 is flush mounted, back-box for wall mounting is available as optional.



- Handheld noise cancelling microphone as standard.
- 3 zones select buttons with light indication
- 1 talk/all buttons with light indication.
- Zone/area indicator windows with backlight.

2.4 "Emergency PA" Control unit 0012

The 0012 is specially made for distribution of Emergency messages. Also during GA (general alarm). This unit will always have highest priority and will mute the alarm during a message.
The 0012 is flush mounted a with the Emergency PA push button with a protective cover.



3 TECHNICAL DATA

3.1 Operation unit SPA 1500

- 19" 3 HE rack/ console mounting unit.
- Operating voltage: 24 VDC.
- Optional mains supply: 110 VAC to 240 VAC.
- Automatic switch over if mains failure occurs.
- Mic input level: 5mV.
- External PA input level: 0 dBm typical.
- External entertainment input level: 0 dBm typical.
- Amplifier inputs level: 0 dBm typical
- Amplifier output level: 100 V line.
- Zone output level: 100 V line.

- Car cassette radio/CD player. (Optional) for entertainment.
- Rack enclosure. (Option).

3.2 PA Control unit SPA 1501

- Flush mounting.
- Operating voltage: 24 VDC.
- Mic line audio level: 5 mV.
- Led indicators for all keys.
- Backlight led`s for area text.
- Withstands rough and moist environment.

3.3 PA Control unit SPA 1506

- Flush mounting.
- Operating voltage: 24 VDC.
- Mic line audio level: 5 mV.
- Led indicators for all keys.
- Backlight led`s for area text.
- Withstands rough and moist environment.

3.4 “Emergency PA” Control unit 0012

- Automatically selecting all zones as an Emergency PA
- Flush mounting.
- Operating voltage: None
- Mic line audio level: 5 mV
- Withstands rough and moist environment.

Public Address system
SPA 1500
Operating instructions

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TITLE: **SPA 1500 – Public Address system**
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Operation instructions

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1 OPERATING INSTRUCTIONS

The SPA 1500 combines a Public Address System with both General Alarm (optional) and entertainment (optional) facilities. The entertainment system is operated and controlled by the operation unit SPA 1500.
The car cassette radio/CD player serves as one of the entertainment sources. (SOURCE A)
One additional entertainment audio source may be incorporated into the system. (SOURCE B)
Ref. illustration on figure 1.

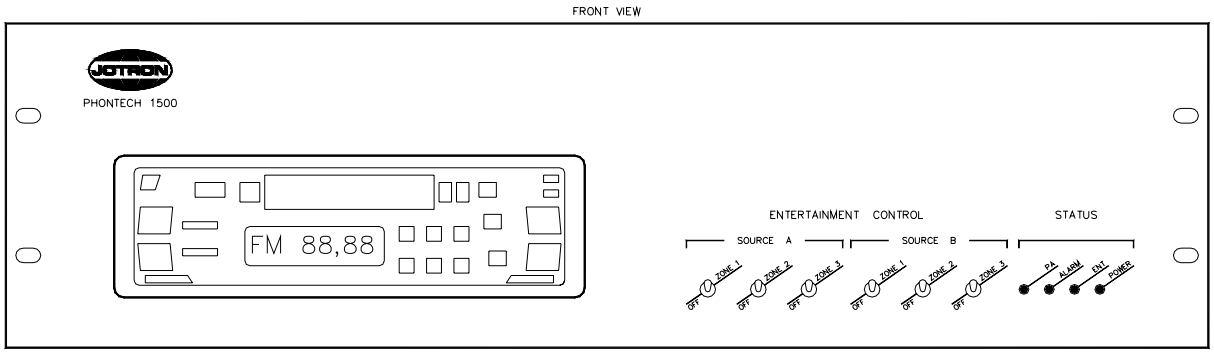

Figure 1- SPA 1500

1.1 Entertainment control

Both sources are directed to the selected zone by means of the entertainment control toggle switches on the SPA 1500 unit. When activated the green **ENT** led on the **STATUS** panel will light up.

When duplicated system (A and B system), the same toggle switches must be operated on both systems! Normally the entertainment source is mounted in A-system only. (An entertainment audio cable is used between the A to B systems for entertainment audio interconnection).

IMPORTANT:
If the two sources are both activated into the same zone they will be mixed together.

1.2 Entertainment source A

The integrated car radio/CD player (Option) in the SPA 1500 unit serves as entertainment source A. Turn the car radio on, tune to a strong station or insert and play a CD and switch the source/zone switches for the desired distribution.

1.3 Entertainment source B

The entertainment source B is an external audio line from e.g. a TV / video system. Make sure the signal is present, and operate as in 1.1 and 1.2.

1.4 Paging from an SPA 1501, 1506, 0012 or external PA and PABX

General:
PA messages should always be as brief as possible.
PA messages should also be of "non-personal" kind, since this message is public.
PA messages should be repeated once to ensure the message is received.
Any Paging activity will lit the green **PA** led on the **STATUS** panel.

Normal operation:
The PA Control Units SPA 1501 and 1506 have three zone keys and one TALK/ALL key.
Paging may be performed in any combination of the three zones, including all.

Unselected zone keys light dim green as backlight. Activated keys light full intensity.

Activate the desired zone key(s) in which to make the announcement. Press the TALK key and speak clearly and directly into the microphone.
Deactivate the zone keys after the paging is finished.

If all zone keys are inactive when the TALK/ALL key is operated, the system AUTOMATICALLY accesses ALL zones.

Emergency operation:
The control unit 0012 is used for Emergency PA messages and is always set up to access ALL zones. Alarms will be muted during Emergency PA messages.

External PA access:
The SPA 1500 system may be connected to an external paging source as a PABX or an Intercom system. Access to perform PA is controlled in this system as an access number or similar. The SPA 1500 interface must be preset for any desired zone selection, normally ALL zones, but in case one of the zones is used for accommodation/sleeping quarters this may be left out.

Ref. figure 2 for illustration.

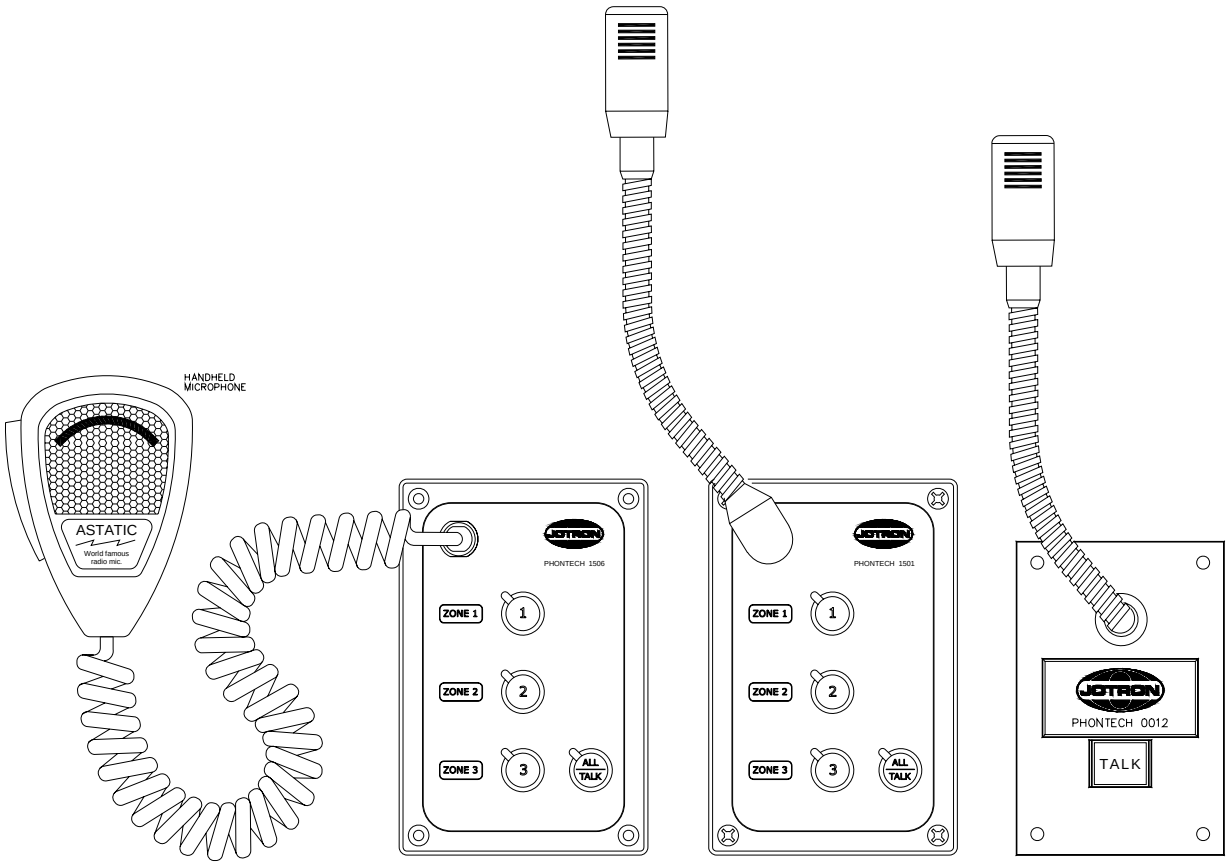

Figure 2 – SPA 1506, 1501 and 0012

1.5 Attention tone Ding Dong (Optional)

When paging is performed an attention tone (ding-dong) will be distributed over the loudspeakers in the selected zone(s).
The duration of this attention tone is approximately 2 seconds. In order avoid interference with the attention tone wait approximately 2 seconds after activation before making the announcement.

1.6 Priority

The SPA system incorporates user priority. The priority ranking is:

1. USER 1 (SPA 1501 / 1506 or “Emergency PA” unit 0012)
2. USER 2 (SPA 1501 / 1506)
3. USER 3 (SPA 1501 / 1506)
4. EXTERNAL PA (PABX / Intercom etc)
5. ALARM
   - 5.1 General Alarm
   - 5.2 Fire Alarm
   - 5.2 Alarm 3 (optional)
6. ENTERTAINMENT

Any action (PA / Alarm) from a service with higher priority will immediately override any ongoing activity. Actions with lower priority will not interfere with the current activity.
The alarm (Option) will temporarily override any ongoing PA when initiated, but the user may immediately regain access by reactivating the TALK button.
All announcements during alarms will be sent to ALL ZONES regardless of any previous PA zone selection.

1.7 Mute local loudspeaker

Each user has one "mute local loudspeaker" circuit output from SPA 1500.
The local speaker(s) to the three different users may be routed through these circuits to obtain undistorted PA messages. This will reduce the risk of audible feedback, and ensure safe operation.

1.8 Override volume control

Each zone has an "override volume control" output from the SPA 1500.
If the system distributes entertainment sources, the use of local volume controls are common.
In order to make PA announcements and Alarms output at nominal levels, the volume controls are equipped with a volume setting bypass circuit controlled by this output.
These outputs can also be used for muting external entertainment systems during PA/Alarm. This ensures any Alarm / PA message will be heard without any disturbing entertainment audio.

2 ALARMS (option)

The SPA system may comprise an alarm tone generator board. (Option). This board has up to three different alarm types.
Active alarms are indicated on the SPA 1500 **STATUS** panel by the ALARM led.

The alarm tone generator board will always be installed if the system includes GA.

2.1 Alarm activation / Reset

The alarms may be automatically activated / reset from an external system (F&G panel). Alternatively an alarm control panel SPA 1503 / 1505 may be connected for manual control and indication.

2.2 Alarm priority

The alarm signal has normal priority below any PA, but above Entertainment. This ensures any Public Announcements to be heard at any time.
The alarm will however temporarily override any ongoing PA when initiated, but the user may immediately regain access by reactivating the TALK button.

Ref. figure 3 for illustration.

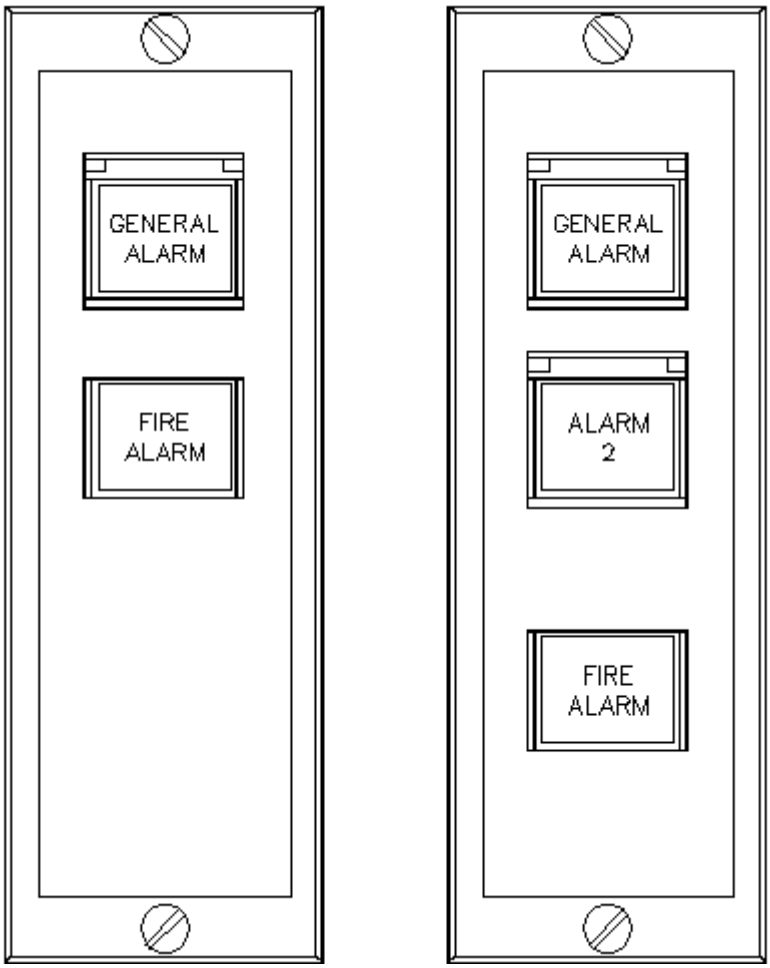

Figure 3 – Alarm control panels SPA 1503 and 1505

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SPA 1500
Installation instructions

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Installation instructions

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SPA 1500
Installation instructions

1 SCOPE

The purpose of this procedure is to state rules and guidelines for installation of communication equipment at the Construction Site.
This procedure is applicable for handling and installation of Central Equipment, Field Equipment and Special Cables.

2 TERMINOLOGY

2.1 Abbreviations

AFC	-	Approved For Construction
C	-	Commissioning
MC	-	Mechanical Completion
PC	-	Pre-Commissioning

3 APPLICABLE DOCUMENTS

- Packing and Preservation instructions
- Equipment/ Cabinet Layout drawings
- External connection diagram

4 SAFETY REGULATORY REQUIREMENTS

The construction work shall be executed in a safe and reliable way. Personnel shall observe and follow all security rules and regulations. Applicable permissions shall be obtained from the responsible person prior to start of any activity.

5 HANDLING

All telecommunication equipment shall be treated as ”fragile electronic equipment” and shall be handled will the utmost care. Any marking on the equipment or instructions following the equipment shall be adhered to through the entire construction phase.

6 GENERAL EQUIPMENT INSTALLATION

Prior to start of installation of any type of equipment, i.e. central or field, indoor or outdoor, the following requirements shall be met:

- all welding completed,
- fixing brackets or plinths complete including all cleaning and painting,
- all overhead work completed,
- all scaffolding and temporary supports removed to prevent accidental damage,
- earth and power available,
- all rooms cleaned
- All paintwork is completed
- Lighting is installed.

Furthermore, for equipment designed for indoor installation, the following additional requirements shall apply:

- Equipment rooms must be protected against ingress of water and dust with entry points sealed and heating/ventilation provided to maintain a temperature and relative humidity in accordance with equipment specifications
- Unobstructed access to equipment rooms for transport of cabinets/cabinets/ equipment into the equipment rooms.

SPA 1500
Installation instructions

7 INSTALLATION OF EQUIPMENT

7.1 Central Equipment

All central cabinets shall be installed in accordance with applicable Layout Drawings and Equipment Arrangement Drawings.

- Care shall be taken while installing the equipment not to cause any unnecessary damage due to unfamiliarity of the equipment.

7.2 Installation of Field Equipment

General

All field equipment, such as Loudspeakers, Beacons, Access Panels etc. shall be installed in accordance with applicable Data sheets, Layout Drawings and Equipment Arrangement Drawings. A document revision check shall be carried out to ensure that the work packages contain the latest issue of the drawings/documents.

Any equipment installed outdoors and left in a turned off condition must be properly weather proofed as per manufacturers manuals. Weather proofing shall ensure that no excess humidity or water enters the equipment causing corrosion.

General Location Rules

Equipment should be located in accordance with the following requirements:

- Protected against damage.
- Protected against vibration.
- Operability and serviceability.
- Display instruments and flashing lights to be legible and visible from main access areas.
- Accessibility for maintenance without scaffolding.

Electrical equipment should not be located in open deck areas.

Equipment, which has to be installed in exposed areas, should be sheltered by use of enclosures.

When Junction Boxes are installed in exposed areas, drain plugs shall be installed.

Final location shall be selected to avoid interference with escape routings, walkways, other equipment, pipes, etc. and obstruction against activities related to transport and lifting operations.

Heavy equipment should not be supported on pipe work, handrails, access ladders or cable ladders.

Equipment located in areas which do not allow for maintenance accessibility as required, should be installed on brackets which are arranged such that the equipment can be rotated, raised or lowered into areas where maintenance can take place without the need for scaffolding.

Junction Boxes

Local Junction Boxes should be installed directly on steel supports adjacent to the equipment. The junction boxes shall be installed so that they are easily accessible.

Area Junction Boxes shall be installed in accordance with the functional requirements discussed above.

Access Panels

Access Panels, which are not installed in consoles/cabinets/racks/etc. but are to be field mounted, shall be located approximately 1.5 m above deck/floor.

Public Address and Alarm System
Public Address and Alarm System equipment shall be located above deck level as follows:

- Loudspeakers: 2 – 3 m
- Beacons: Max, 3 m.

Loudspeakers shall not be located above suspended ceilings or behind obstructions, which will prevent free space sound distribution.
Loudspeakers shall be installed on brackets, which allow for future adjustments as follows:

- At the horizontal plane: 180°
- Downwards: 90° from the vertical plane.

8 INSTALLATION OF CABLES

8.1 Overall Installation Instructions

General
Installation of cables including, but not limited to, pulling, fixing, termination and testing shall be performed in accordance with the documentation for this Project.
Cable splicing shall be avoided.
Any deviations discovered shall be reported to the responsible Construction Manager.
Do not use cables in connection with other systems. This to prevent disturbance and noise caused by interference.
Pulling
The cable tail shall have sufficient service length in order to allow the cable to run via the top of the cabinet and terminated at the bottom, or the other way, depending on bottom or top entry. For a 2 meters high cabinet typical service length is 4 meters.
The cable installation shall be in accordance with procedures given by the Manufacturer of each of the different cable types.
Fixing
The below recommendations shall be superseded by the Manufacturer's recommendation, if any.
When entering a Cabinet or Junction Box the cable shall be clamped no more than 10x the cable diameter from the gland.
Clamps shall be of non-corrosive material, without sharp edges against the cable. Plastic cable clamps shall be approved for ships environments, if used.
Cable clamps shall not be tightened in any way so that the cable can be damaged.
Termination, Marking and Labelling
Termination facilities shall be designed to give safe and secure connections for wires and cable cores.
Regulations regarding segregation, material, sizing, colour coding, marking, etc. shall be followed.
Adequate space shall be allowed for to give the installation a neat appearance. Sufficient access for maintenance shall always be a major requirement for termination systems.
The cables shall be stripped as close as possible to the terminal block. Special care shall be taken when removing the outer sheet to prevent the cores from being damaged. For armoured cables the armour shall be removed at the cable entry.

SPA 1500
Installation instructions

For identification each cable shall be marked with cable tag number clearly visible inside cabinets. For smaller units the cable identification shall be located outside the unit (outside the cable glands).
When the number of cables makes it difficult to locate each cable, the first pair in the cable shall be marked with the cable tag number.
The armour shall be tied back, covered with a yellow/green sleeve and terminated on the Protective Earth Bar (PE).
The screen shall be covered with a transparent sleeve and terminated on the Telecom Earth Bar or isolated based on criteria as below:

- For interconnection between a main equipment cabinet and a Field Termination Cabinet (FTC) or main Distribution Frame (MDF) the screen shall be terminated in the FTC/MDF and isolated in the main cabinet.
- For interconnection between main equipment cabinets the screen shall be terminated in one end only. Preference shall be given to the main equipment cabinet seen as the origin of the cable.
- For interconnection between Field and Central Equipment the screen shall be terminated in the Central equipment and isolated in the Field Equipment.

The cable cores shall have sufficient length to reach all terminals in the terminal block.
Wires shall be terminated using a crimped lug or ferrule. The lug shall be applied using appropriate tools for the application.
All cores shall be terminated.
Individual cores shall be identified with a closed slip-on type of plastic identification ferrule carrying a number identical to the terminal (not valid for “plug type” connections).
For terminal blocks of IDC type or similar (Krone, Wago, Bix blocks, etc.) the correct tool shall be used for core insertion. Knives, screw drivers, etc. shall not be used.
For twisted pair type of cable the cores shall be kept revolved as close as possible to the terminal.
The correct tool for the application shall always be used.

Testing
Testing of Special Cables shall be performed at the end of installation or in the mechanical completion/pre-commissioning phase.

9 MAKING GOOD INSTALLATION

9.1 Cleaning-up during and after Installation

When any of the above activities are completed, the equipment shall be thoroughly cleaned and tied up. All equipment shall be cleaned up before Mechanical Completion and/or commissioning can start.
All debris shall be removed and no wiring shall be loose or not terminated. The area in the immediate vicinity of the equipment shall be clear of ALL other activities.

9.2 Protection work after Installation

Protection work means to guard against the effects of all actions and influences encountered during handling, installation, mechanical completion and commissioning and in the idle periods between the different activities and/or prior to start-up and hand over. All equipment shall be preserved and protected against harmful environmental and other effects from delivery to start-up.
Preservation materials shall be of plastic or metal film and sealed suitable for the ambient temperature range.

10 DETAIL SPA 1500 INSTALLATION

The SPA system is adapted to fit rack mounting 19", and standardized dimensions in modern ship consoles.
The system may be delivered with rack enclosure. The racks are from 6HE in the smallest configuration (SPA 1510) up to 12 HE in the biggest version (SPA 1530).
Depth of all rack-mounted units is 600 mm.

Most of the SPA systems are single systems without alarm (GA) but with entertainment included. Re. **Figure 1** in doc no. 96106-000-DE for typical installation setup.
Use the “External connection diagram” (doc 96106-000-EC) and detail project related terminal drawings during installation.

If the system is used as PA onboard a passenger vessel or if it is used as an integrated PA and GA, then the entire system shall be duplicated.
This means two central units SPA 1500 with amplifiers and separate routing of loudspeakers and flash lights. The duplication applies also to the field junction boxes. Operator panels will have separate routing to each SPA 1500.
Re. Figure 2 in doc no. 96106-000-DE for typical installation setup.
Use the “External connection diagram” (doc 96106-000-EC) and detail project related terminal drawings during installation.

10.1 Power requirements

The operating power for SPA 1500 internal is 24 VDC.
If only 24VDC is supplied, this must be connected to terminals 91/92.

On passenger vessels or if GA is included, both ships mains supply and emergency power supply must be connected to each A and B system.

- Ships main supply 110-230VAC
- Emergency power supply 24VDC (connected to terminals 94/95)

SPA 1500
Installation instructions

10.2 Loudspeaker network when distribution of "GA"

- Loudspeaker network arranged as a closed loop.
- Or with fuses/breakers or electrical protection provided at each deck such that failure/short circuit in any deck does not affect other decks or the central unit.
- The loudspeaker lines must be a separate network for A and B system with separate routing. Field junction boxes must also be separate.

10.3 Approved loudspeakers and sound pressure levels

- Loudspeakers to be of 100V line, proven marine design according to IEC60945 and suitable for the selected positions. Sound pressure level to be minimum as required by IMO/Solas & class.
- Sound pressure level with ship under way in normal conditions and emergency announcements (MSC/Circ.808):
  - Interior and exterior spaces: 75dbA and at least 20dbA above ambient noise levels.
  - Exterior spaces: 80dbA and at least 15dbA above ambient noise levels.
  - In sleeping positions: 75dbA.

10.4 Cable requirements

The 24 VDC power supply cable conductor area is $\geq$4 mm^2.
The 110>230 VAC cable conductor area is $\geq$1.5 mm^2.
All signal cables must be twisted pairs with outer screen.
All signal cables conductor area is $\geq$0.75 mm^2.
Do not combine different systems in the same cable. This to prevent disturbance and noise due to interference.

10.5 Mounting / Screen termination

SPA 1500 operation unit is mounted in a 19" standard rack or console, and fixed with front bolts.
For flush mounting: cut-out dimensions are 130 x 445 mm (h x w)
Cable inlet from behind.
SCREEN CONNECTION.
In order to obtain maximum performance after installation, it is important to terminate the cables and ground the screens in a good manner.
The cables are to be de- isolated by removing the outer insulation. Then the screen braid is cut off app. 30mm longer than the outer isolation.
The conductor is de-isolated and fitted with end-crimps before they are screwed on to the terminal.
The outer screen, which now is open, is clamped onto the cable fixing arcs inside the cabinet.
Cable ties of conductive type are recommended for best result.

Please see figure 1 for more details.

SPA 1501 pa control unit is flush mounted in standardized measurement ship consoles.
For other flush mounting: cut-out dimensions are 90 x 123 mm.
Cable inlet from behind.
To ease the cable termination the screw terminals are plug-in type.

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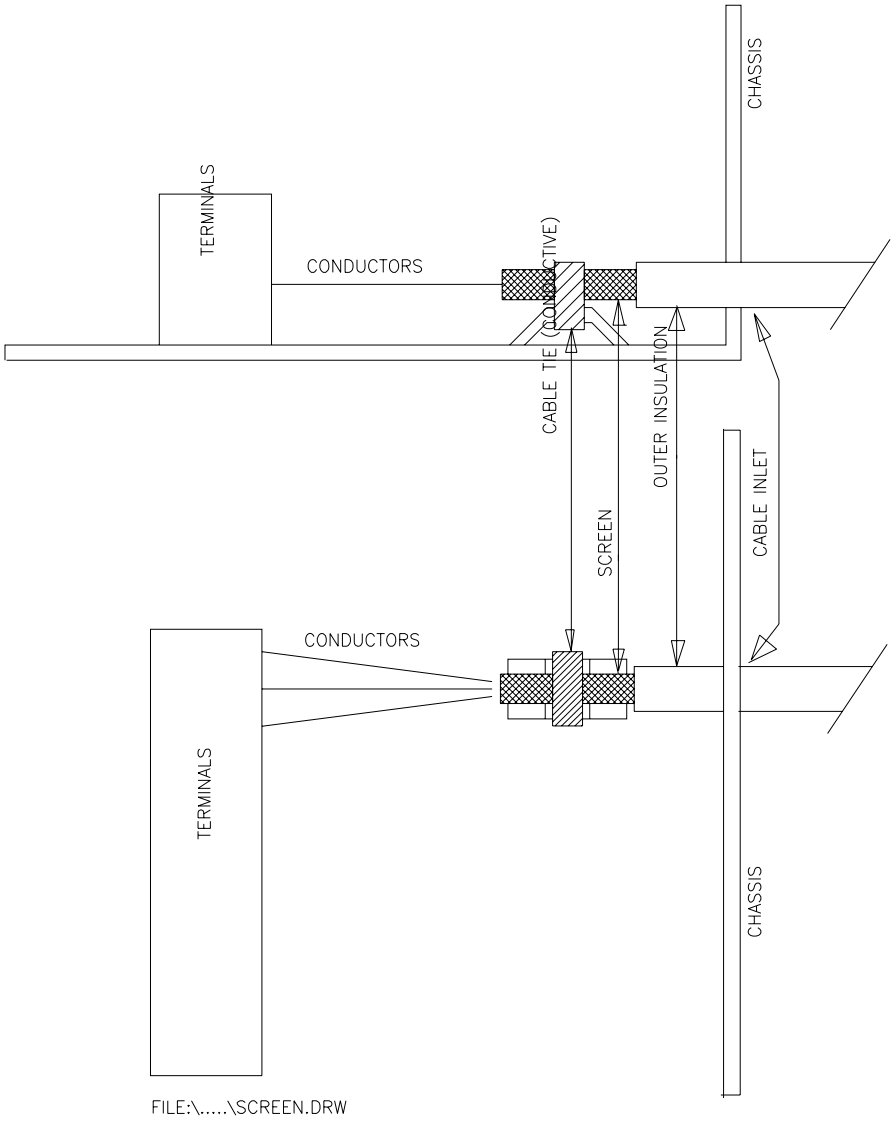
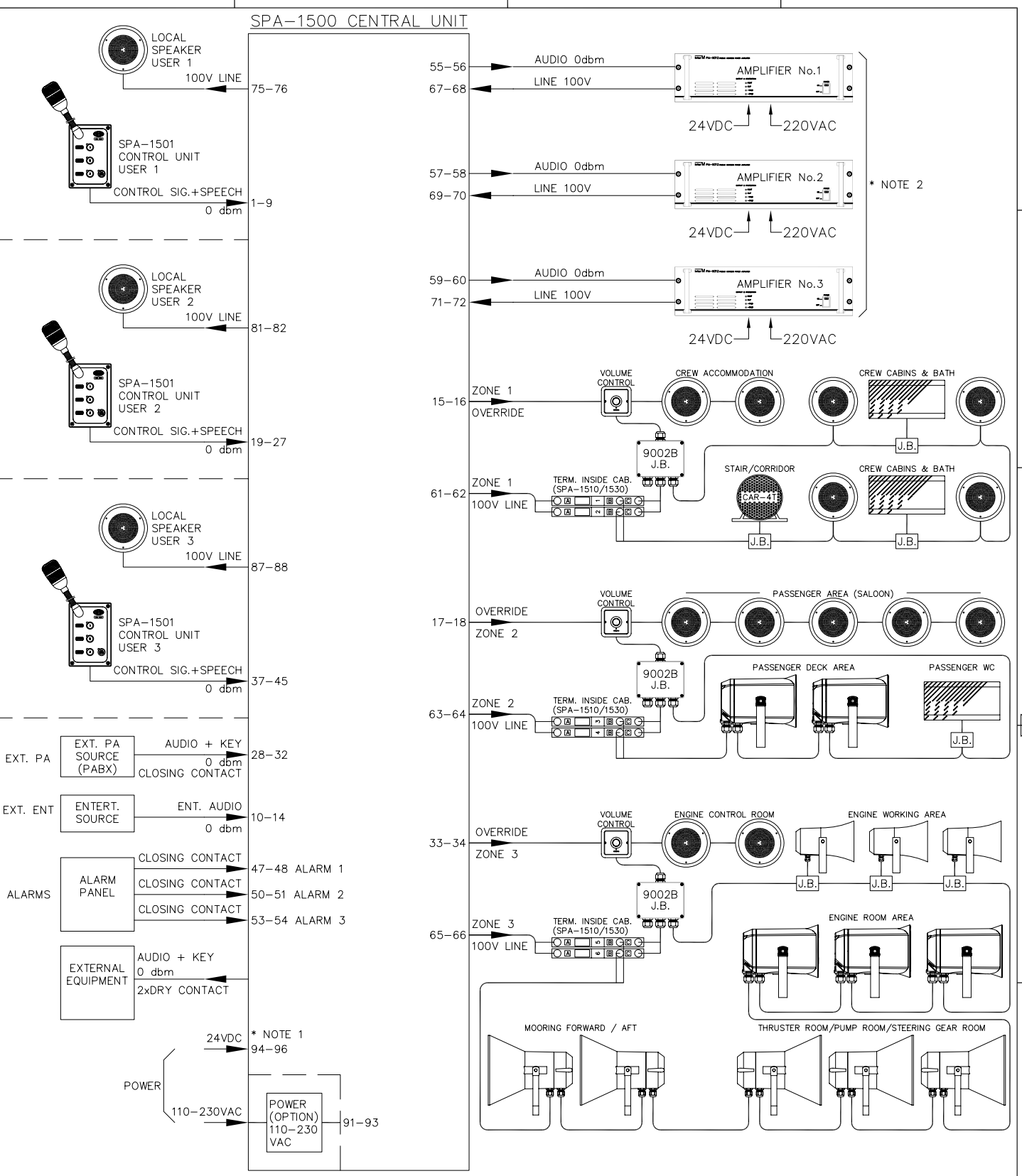
FIGURE 1

The cable outer screen is to be terminated as shown. Conductive type of cable ties is



recommended to obtain best possible screen connections.



NOTES:

NOTE 1: IF ONLY 24VDC IS PRESENT THEN CONNECT THE LEADS TO TERMINAL 91–92. TERMINAL 94–95 IS UNCONNECTED.

NOTE 2: THE AMPLIFIER(S) MAY BE LOCATED AWAY FROM THE SPA–1500 OPERATION UNIT.

NOTE 3: J.B. JUNCTION BOX IS NEEDED WHEN LOUDSPEAKER HAS ONE GLAND OR IS EQUIPT WITH FLAYING LEAD.

REV No.	ISSUE DATE	REASON FOR ISSUE	PREPARED	CHECKED	APPROVED
1	18.09.2009	Change order No. 1219	R.F.	ASk	ASk
0	05.02.1997	AS BUILT.	TLy	ASk	ASk

TITLE: PUBLIC ADDRESS SYSTEM, SPA–1500.
CLOSED LOUDSPEAKER LOOP.
BLOCK DIAGRAM.

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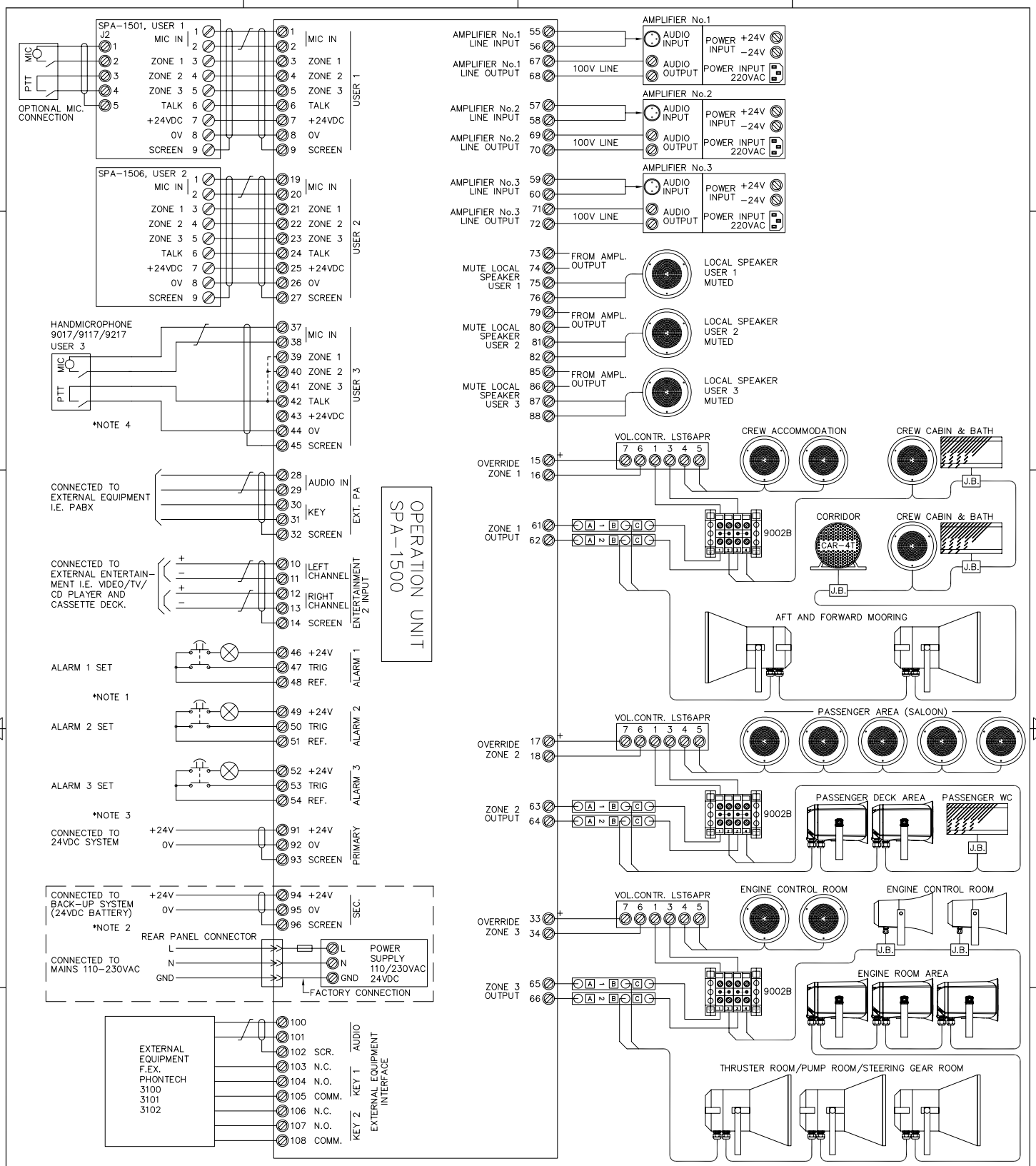
SIZE: A3 | PAGE: 1 of 1
DOC. No: 96106–000–BD
FILE NAME: 96106–000–BD.DWG



NOTE 1: DISPLAYS THE PRINSIPLE OF MANUAL ALARM PANEL CONNECTION. THE SWITCHES MAY BE AUTOMATICALLY OPERATED BY A F&G SYSTEM.

NOTE 2: THE CONNECTIONS SHOWN IN DOTTED AREA VIEWS THE CONNECTION IF BOTH MAINS AND BACKUP IS PRESENT.

NOTE 3: DISPLAY CONNECTION IF ONLY 24VDC IS PRESENT.

NOTE 4: DISPLAY THE CONNECTION OF HANDHELD MICRO-PHONE TYPE 9017/9117/9217 ON THE USER 3 INPUT. EXAMPLE ZONE 1 & 2 ACTIVATED.

REV No.	ISSUE DATE	REASON FOR ISSUE	PREPARED	CHECKED	APPROVED
2	15.10.2009	CHANGE ORDER No. 1219	R.F.	ASk	ASk
1	06.03.1997	CHANGE ORDER No.636	TLy	ASk	ASk
0	05.02.1997	AS BUILT.	TLy	ASk	ASk

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TITLE: SPA SYSTEM.
CLOSED LOUDSPEAKER LOOP.
INSTALLATION DRAWING.
EXTERNAL CONNECTION.

SIZE: A3 | PAGE: 1 of 1

DOC. No: 96106-000-EC

FILE NAME: 96106-000-EC.DWG

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Doc.No.: 96106-000-CP

COMMISSIONING PROCEDURE
FOR
SPA-1500 SYSTEM

1. CHECK THAT CABLING IS ACCORDING TO APPROVED DRAWINGS.

2. USE SPA-1501 AND 1593 UNIT TO ACCESS ZONE 1 TO 3 AND VERIFY AUDIO IN THE CORRESPONDING SPEAKERS. ALSO VERIFY 24VDC VOLUME OVERRIDE OUTPUT FOR ZONE 1-3(TERM.15/16,17/18,33/34) IF IN USE.

3. ACTIVATE ENTERTAINMENT IF INSTALLED AND VERIFY THAT IT'S DISTRIBUTED TO THE SELECTED ZONE.(SWITCHES IN FRONT)

4. IF AN ALARMCARD IS INSTALLED TEST THAT BOTH ALARMS IS DISTRIBUTED TO ALL ZONES AND CAN BE OVERRIDED BY THE ACCESS PANEL(S) 1501 AND 1593. (USER1 TO USER 3 AND EXTERNAL INPUT)
   CHECH PRIORITY AS FOLLOW:
   - PRIO 1 = USER 1 (1501 OR 1593)
   - PRIO 2 = USER 2
   - PRIO 3 = USER 3

5. IF AN ALARMCARD OR DING-DONG CARD IS INSTALLED EACH ANNOUNCEMENT COULD START WITH A PRETONE.

6. IF THE EXTERNAL INPUT IS IN USE, THEN CHECK THAT THE AUDIO IS DISTRIBUTED TO THE PRESELECTED ZONES(DIPSWITCH S7 1-3)

7. IF EXTERNAL OUTPUT(AUDIO/KEY) IS IN USE, VERIFY AUDIO IS PRESENT AT TERMINALS 100/101 REGARDLESS OF THE ZONE SELECTIONS. KEY 1 AND 2 OUTPUT IS POTENSIAL FREE RELAY CONTACTS.

02	19.08.2009	REVISION, EM 1209	CD	TBA	CD
01	11.10.2006	CUSTOM REQUIRE	TBA	PA	AHJ
0	05.02.02	CUSTOM REQUIRE	AHJ	TEH	AHJ
REV No:	ISSUE DATE	REASON FOR ISSUE	PREPARED	CHECKED	APPROVED

TITLE: SPA 1500 system
COMMISSIONING PROCEDURE

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DOC no: 96106-000-CP	
FILE NAME: 96106-000-CP Commissioning procedure.doc	

KEY 1 TERM 103/104/105, KEY 2 TERM 106/107/108. THESE CONTACTS

ACTIVATES WHEN ALL ZONES ARE ACTIVE

ITEM	ACCEPTED (YES/NO)	COMMENTS

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SPA 1500
Maintenance Instructions

Public Address system
SPA 1500
Maintenance instructions

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REV No:	ISSUE DATE	REASON FOR ISSUE	PREPARED	CHECKED	APPROVED
02	19.08.2009	REVISION, EM 1209	CD	TBA	CD
01	11.10.2006	For acceptance	TBA		

TITLE: SPA 1500 - Public Address system

Maintenance Instructions

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Phontech doc no:

96106-000-MI

SIZE: A4

1.0 MAINTENANCE INSTRUCTIONS

1.1 CORRECTIVE MAINTENANCE INSTRUCTIONS

Preventive maintenance and service can prevent a break-down of the valuable equipment that is entrusted to your care.

- Maximum safety to lives and property- Lower operating costs for your company
- Saving time - and headaches - for yourself

Decide a regular maintenance schedule

1.1.1 Maintenance log
The log must be updated with all maintenance and service work, as well as faults or irregularities. These notes may be a great value for yourself or the service engineer.

1.1.2 Spare parts
Keep your stock of spare parts up to date in an orderly manner.
Continuous record of spare parts is strongly recommended.

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1.2 RECOMMENDED CONTROL ROUTINES

- Check all central units and field units for damage or other irregularities that can cause damage to the system.
- **Operation control**.
  This control must be carried out on all access units.
  Use the microphone and check that access is possible from all the access units.
  The Operating instruction doc no. 96106-000-OI can be used as a guide during the test.
  Check that audio is clear and that the loudspeaker coverage is OK.
  Verify that muting is OK for each access unit local loudspeaker when PA message.
  Check access in correct zones.
- **Override outputs**
  Check that override function is OK on all volume control units.

  Write down every irregularity in the log book.

1.3 FAULT FINDING

1.3.1 Fuses
Replace a blown fuse with a new one of the same value. If the second fuse blows, locate and correct the fault.

Make sure that you always have a good supply of fuses.

1.3.2 Contacts
A high percentage of failures are caused by faulty cable connections, plugs, sockets etc. Such details are checked very carefully during installation, but it is difficult to guard fully against vibration, corrosion and dust.

You are therefore advised to make an occasional thorough check on all plugs, sockets, terminal boards, switches and relays.

1.3.3 Equipment/loudspeakers
Keep all equipment clean - outside and inside. Keeping the main switch off, remove cover plates and clean all parts carefully - using a soft brush. Be careful not to damage components. Keep all ground connections tight and clean.

1.4 FAULT FINDING PROCESS.

1. Consult the system description together with the drawings.

2. Make an analysis of the symptoms as far as possible. Check for electrical or mechanical noise, instrument readings, etc.

3. The error symptoms should be written into the Maintenance Logbook together with instrument readings and all the actions carried out during the fault finding process, even if the influence to the error symptoms seems neglectable.

   THIS IS VERY IMPORTANT SPECIALLY IF THE FAULT IS NOT DETECTED AND FURTHER SUPPORT IS NECESSARY, MAY BE FROM THE MAINTENANCE DEPARTMENT OR FROM THE VENDOR.

4. Carrie out the following points except for the points of no interest due to the error conditions:

   a. Make a thorough check on all plugs, sockets, terminals, boards, switches and relays. Watch specially the cable arrangement and look for any damage of the wires.

   b. Check all fuses and correct level of supply voltages. The fuses and the power arrangements are located in the Central Equipments.

   c. Look for any damaged parts or components in the Central Equipments.

   d. If you suspect the fault(s) to be located within the Central Equipments, replace with spare parts.

   e. When faults are detected and corrected, carry out a check of the complete system.

PLEASE REMEMBER TO ORDER OR REPLACE ANY USED SPARE PARTS AS SOON AS POSSIBLE .

SPA 1500
Maintenance Instructions

1.5 DESCRIPTIONS AND ADJUSTMENTS

W A R N I N G !

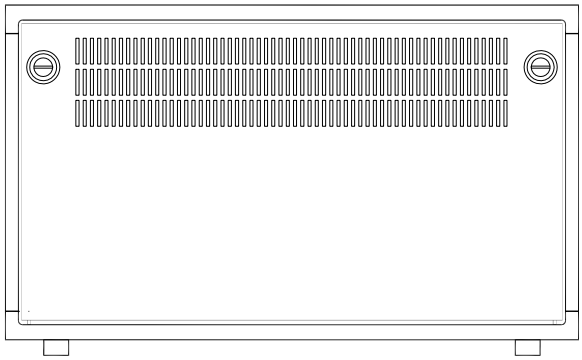
Before attempting to make emergency adjustments of controls with which you are not fully familiar:

- Write down and mark accurately all original control pre-settings. Return all controls to original settings if a readjustment showing no improvement in performance.

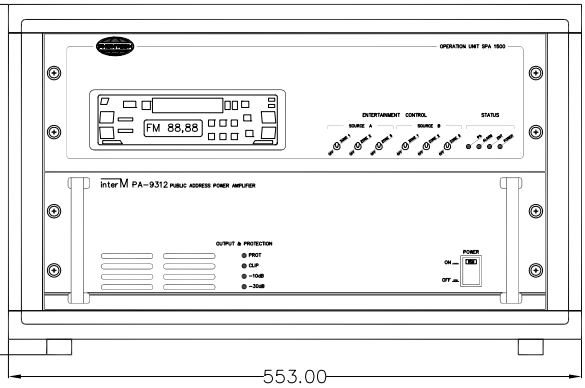
- Unless extreme emergency do not try to readjust factory settings. Do not make modifications or attempts to operate the equipment beyond factory specifications which will include a reasonable safety margin. Maladjustments may cause serious damage with the performance of the equipment.

IN ADDITION, POSSIBLE WARRANTY CLAIMS WILL BE VOID!

REAR VIEW



FRONT VIEW



SIDE VIEW

EQUIPMENT DATA:

MANUFACTURER	: PHONTECH AS.	FIXING DETAILS	: YARD SUPPLY.
MODEL/TYPE	: SPA-1510.	ACCESS	: FRONT.
RACK/BOX SUPPL.	: SCHROFF.	CABLE ENTRY	: BOTTOM.
RACK/BOX TYPE	: MINI-6.	GLANG TYPE	: NA.
MATERIAL	: ALUMINIUM/STEEL.	PROTECTION IP	: IP-20.
COLOUR	: RAL 7030/7035.	POWER SUPPLY	: 24VDC/220VAC.
WEIGHT OF UNIT	: 30,00Kg.	POWER CONSUMP.	: DEPEND ON AMPL.
MOUNTING	: ON SHELF.	HEAT DISSIPATION	: DEPEND ON AMPL.

REV No.	ISSUE DATE	REASON FOR ISSUE	PREPARED	CHECKED	APPROVED
1	2001.10.09	CHANGE ORDER No.876.	R.F.	ASk	TLy
0	99.01.20	AS BUILT.	R.F.	ASk	TLy

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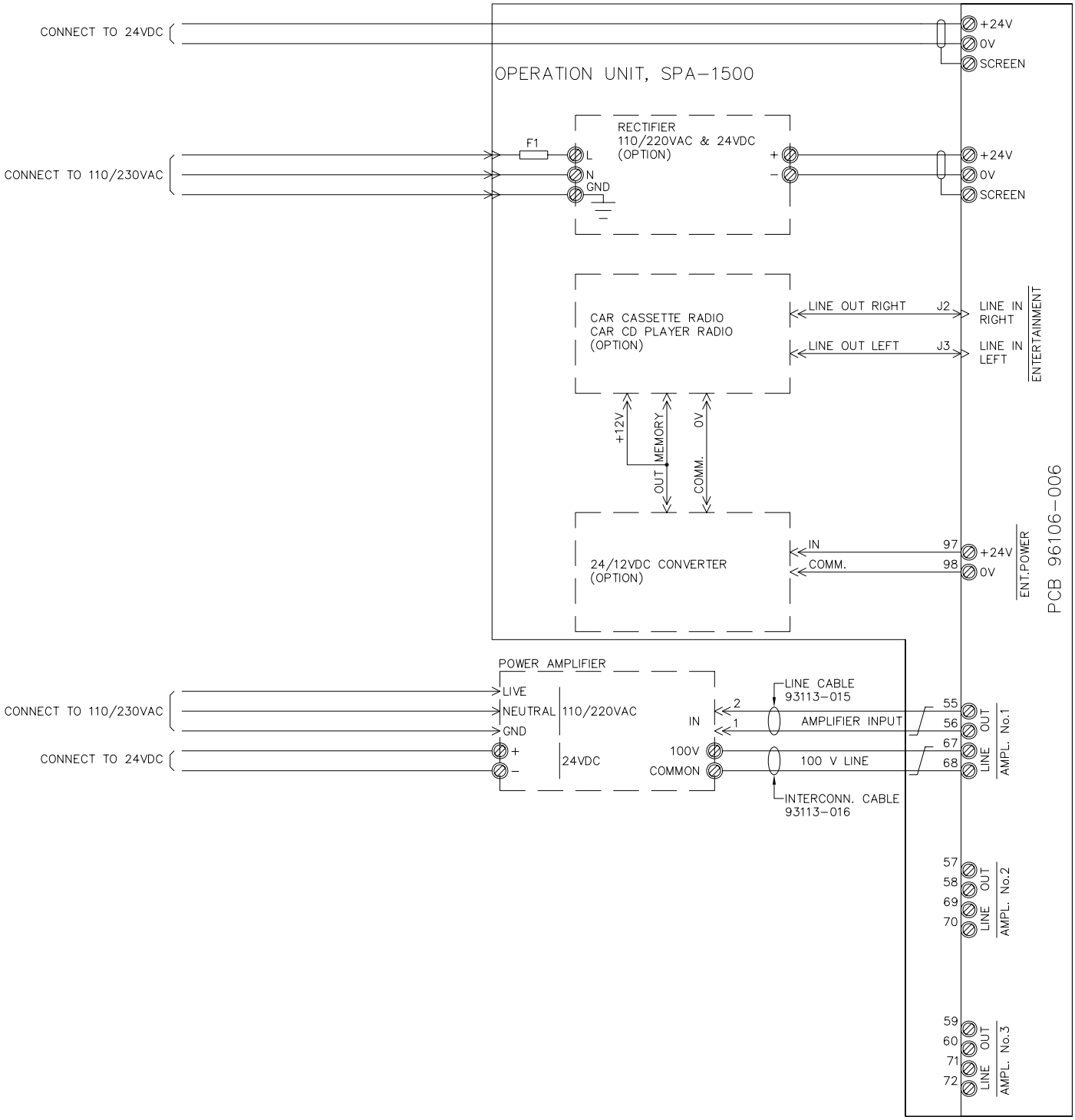
TITLE: SPA SYSTEM, CONTROL & AMPLIFIER RACK.
SPA 1510.
MECHANICAL LAYOUT.

SIZE: A3 | UED No: 92

DOC. No: 96106-004-ML

FILE NAME: 96106-004-ML.DWG



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0	05.02.1997	AS BUILT.	TLy	ASk	ASk

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TITLE: SPA SYSTEM.
CONTROL & AMPLIFIER RACK.
SPA-1510.
INTERNAL WIRING.

SIZE: A3 | UED No: 92

DOC. No: 96106-004-IW

FILE NAME: 96106-004-IW.DWG

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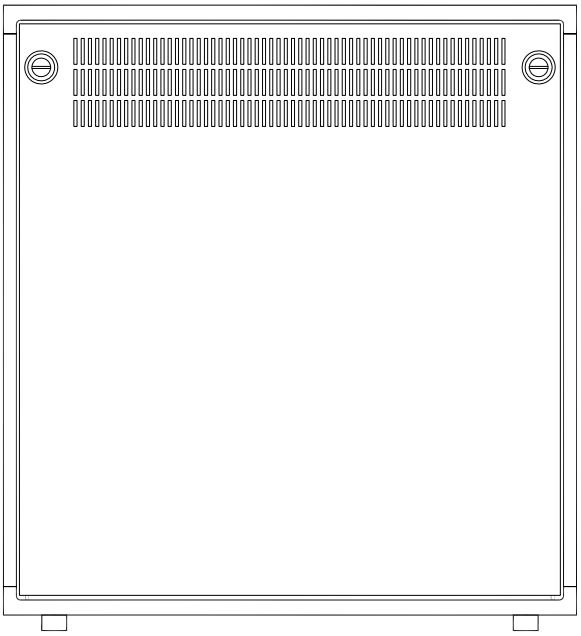
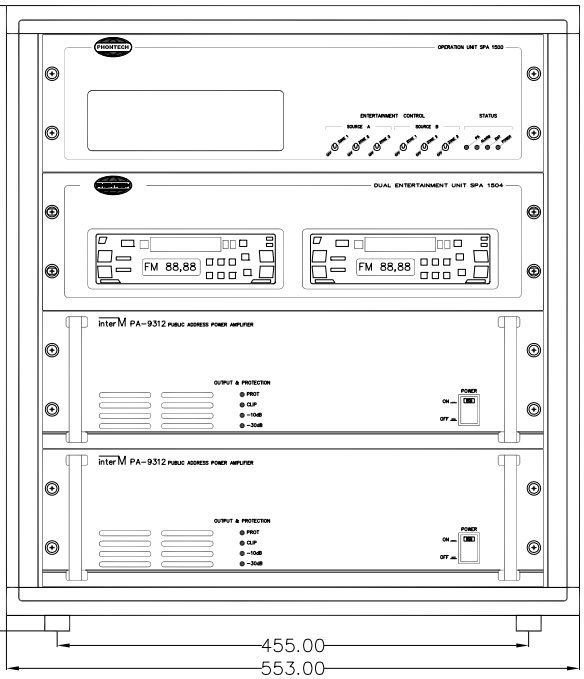
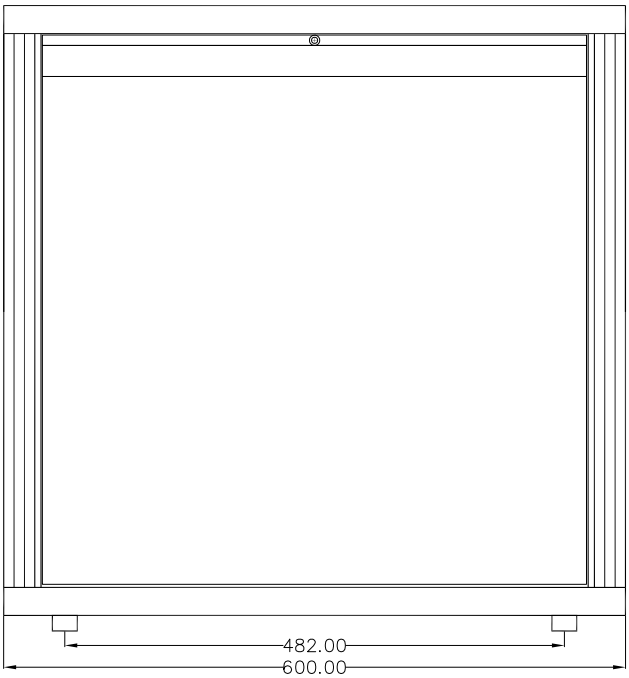


FRONT VIEW



SIDE VIEW



EQUIPMENT DATA:

MANUFACTURER	: PHONTECH AS.	FIXING DETAILS	: YARD SUPPLY.
MODEL/TYPE	: SPA–1530.	ACCESS	: FRONT.
RACK/BOX SUPPL.	: SCHROFF.	CABLE ENTRY	: BOTTOM.
RACK/BOX TYPE	: MINI–12.	GLANG TYPE	: NA.
MATERIAL	: ALUMINIUM/STEEL.	PROTECTION IP	: IP–20.
COLOUR	: RAL 7030/7035.	POWER SUPPLY	: 24VDC/220VAC.
WEIGHT OF UNIT	: 60,00Kg.	POWER CONSUMP.	: DEPEND ON AMPL.
MOUNTING	: ON SHELF.	HEAT DISSIPATION	: DEPEND ON AMPL.

REV No.	ISSUE DATE	REASON FOR ISSUE	PREPARED	CHECKED	APPROVED
1	2001.10.09	CHANGE ORDER No.876.	R.F.	ASk	TLy
0	99.01.20	AS BUILT.	R.F.	ASk	TLy

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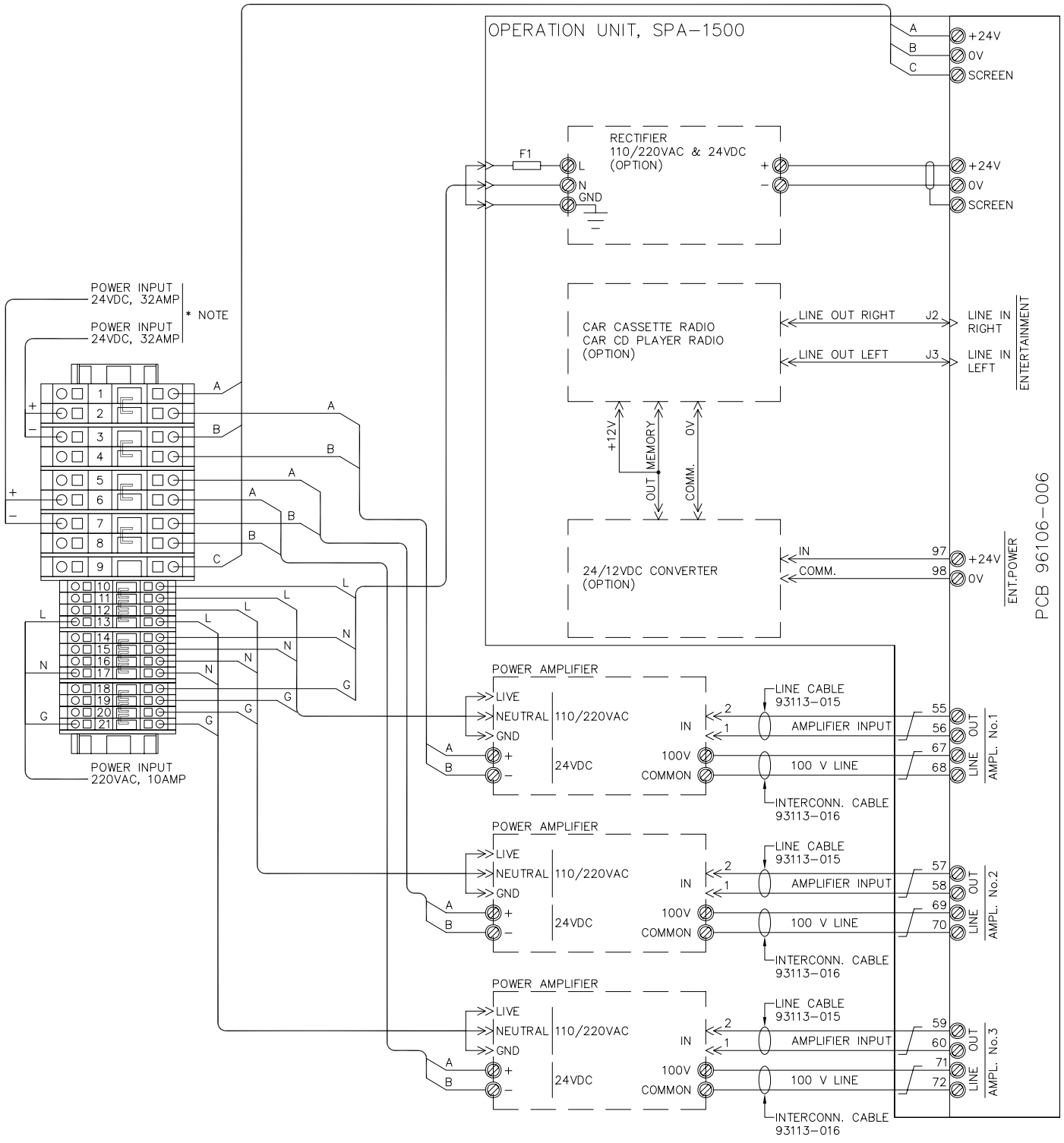
TITLE: SPA SYSTEM, CONTROL & AMPLIFIER RACK.
SPA 1530.
MECHANICAL LAYOUT.

SIZE: A3 | UED No: 92

DOC. No: 96106–005–ML

FILE NAME: 96106–005–ML.DWG



NOTE:
THIS SECOND CIRCUIT IS REQUIRED DEPENDANT OF THE
SYSTEM CONFIGURATION. SEE TABLE BELOW.
(ORDER OF AMPLIFIERS ARE INDIFFERENT TO CONFIGURATION).
THIS IS DUE TO HIGH CURRENT REQUIRMENT.

AMPL.1	AMPL.2	AMPL.3	NUMBER OF CIRCUIT
120W	120W	0	1 CIRCUIT
120W	120W	120W	1 CIRCUIT
120W	120W	240W	2 CIRCUIT
120W	120W	360W	2 CIRCUIT
120W	240W	240W	2 CIRCUIT
120W	240W	360W	2 CIRCUIT
120W	360W	360W	2 CIRCUIT
240W	240W	240W	2 CIRCUIT
240W	240W	360W	2 CIRCUIT
240W	360W	360W	2 CIRCUIT
360W	360W	360W	2 CIRCUIT

REV No.	ISSUE DATE	REASON FOR ISSUE	PREPARED	CHECKED	APPROVED
1	26.01.2004	CHANGE ORDER No. 978	R.F.	ASk	ASk
0	05.02.1997	AS BUILT.	TLy	ASk	ASk

TITLE: SPA SYSTEM.
CONTROL & AMPLIFIER RACK.
SPA–1530.
INTERNAL WIRING.

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DOC. No: 96106–005–IW
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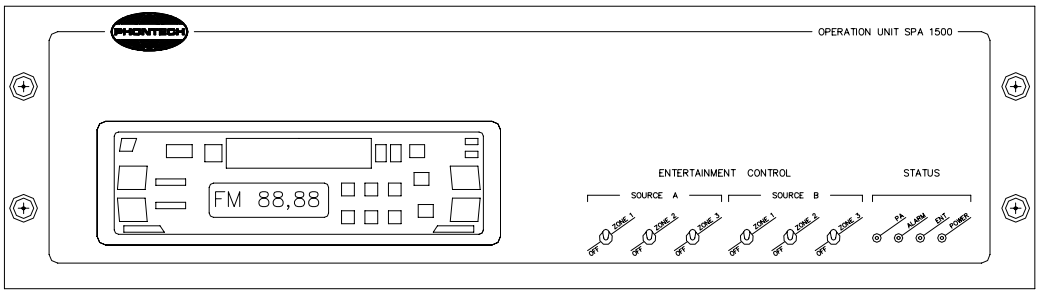
Doc.No.: 96106-001-DE



Jotron AS Jotron UK Ltd. **Jotron Phontech AS** Jotron Consultas AS Jotron Asia Pte. Ltd. Jotron USA, Inc. UAB Jotron	**TITLE:** **SPA SYSTEM OPERATION UNIT SPA 1500 DESCRIPTION**						
				3	1209	09/08 19	CD
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	UED No.: 92	**REF:**	**APPR.**	**REV.**	**CO.**	**DATE**	**SIGN**

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1.0. INTRODUCTION.

A pa and entertainment system consists of PA control units, operation unit, and the amplifiers.
The operation unit SPA 1500 is the central unit in a SPA system.
The compact design makes it easy to install. The mounting is in standard 19" rack or console.
All the electronics and logic required is located in the SPA 1500.
The amplifiers may be placed away from the SPA 1500, but this requires more cabling.

2.0. GENERAL DESCRIPTION.

The SPA 1500 is in max version is comprising the following parts:
- System board for SPA 1500.
- Car cassette radio/ CD player. (Option)
- Power supply for 110 > 230 VAC (Option)
- DC converter for the car radio. (Option)
- Entertainment control panel.
- Status panel leds.
- Screw terminals for power and signal cables.

3.0. SYSTEM BOARD FOR SPA 1500.

This PCB contains all the electronic parts required in an operation unit.
The below description refers to drawing 96106-006-CD.

3.1. AUDIO ROUTING.

The 3 microphone line inputs are routed through the user audio switching relays RE1-RE3 to the preamplifier (M19, M20) with automatic gain control. The preamp. raises the audio from microphone level to approximately 0 dBm. (775 mV)
0 dBm is the appropriate level to the power amplifier inputs.

The external pa audio interface is on 0dBm level, and goes through RE4 directly to the audio buffer.

Attention tone ding-dong board. (Option).
This circuit board generates a ding-dong sound in the loudspeakers prior to a PA message. An active TALK/KEY signal from the three users or the external pa source starts the ding-dong generator.
Note that the ding-dong only work in PA mode, entertainment does not start the ding-dong.

Alarm tone generator board (Option).
The alarm is an optional facility. There are three different alarm sounds available in the system.
The alarms are started and stopped from an external control panel or from automatic alarm panels like a fire detector panel.

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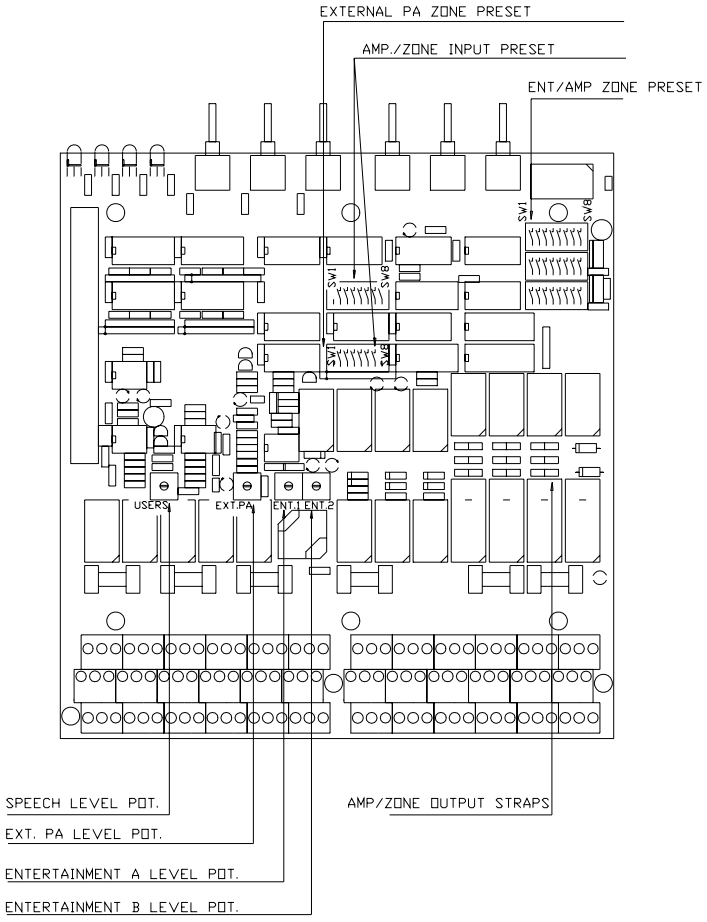
Audio buffer (M20). The above described audio sources, speech, ding-dong and alarm are added into one audio buffer. From this buffer the audio goes through the amplifier input relays (RE6-RE8) to the amplifiers.

The amplifier outputs are fed back to the operation unit for zone switching.
From the zone relays RE9-RE11 the output goes to the loudspeaker network.

See below for an overview over the trimmer pot meters and the dipswitches location onboard the PCB 96106-006.



This board is mounted inside the operation unit SPA 1500.

EXTERNAL PA ZONE PRESET: The first 3 switches on dipswitch S7 is for the external PA zone preset (typical PABX)
AMP/ZONE INPUT PRESET: The last 3 switches on dipswitch S7 is for the amplifier 1 zone. The three first switches on dipswitch S8 is for the amplifier 2 zones. The three last switches on dipswitch S8 is for the amplifier 3 zones.
ENT/AMP ZONE PRESET: The dipswitches S9, S10, S11 is for the entertainment amplifier zoning. (See description in this document on page 6).

SPEECH LEVEL POT: Common trimmer potentiometer for the users 1, 2 and 3.
EXT PA LEVEL POT: Trimmer for the external PA audio level. (Typical PABX etc.)
ENTERTAINMENT "A" LEVEL POT: Trimmer for the entertainment sources A audio level. (Typical internal car radio)

ENTERTAINMENT "B" LEVEL POT: Trimmer for the entertainment source B audio level. (Typical an external source)

AMP/ZONE OUTPUT STRAPS: Strapping field for the amplifier output to zones strapping.

3.2. PRIORITY.

The system includes user priority.
The priority ranking is fixed. Therefore the users connection into the system board must be decided according to the desired priority ranking.
The ranking is as follows:

1. PRIORITY USER 1
2. PRIORITY USER 2
3. PRIORITY USER 3
4. PRIORITY EXT. PA.

3.3. ZONE SELECTOR LOGIC.

The system includes three PA / ENT zones.
The user panel has three zone selector keys.
If none of the zones are selected the system automatically select all three zones. (All call)

3.4. EXTERNAL PA ZONE SELECTOR.

The external pa input does not have zone select possibility.
Therefore this set-up must be preset.
This is decided on the dipswitch S7.

S7 SWITCH 1 = ZONE 1
S7 SWITCH 2 = ZONE 2
S7 SWITCH 3 = ZONE 3
The location of the different dipswitches aso. is indicated on page 4. Fig. 1.

3.5. AMPLIFIER ZONE PRESET.

Due to the fact that the amplifiers can be dedicated to different zones, both the input and the output routing must be totally flexible.
Both the entertainment input and the PA input must be strapped / preset in accordance to the tables on page 6.
The location of the different dipswitches aso, is indicated on page 4. Fig.1.

3.6. EXTERNAL EQUIPMENT AUDIO OUTPUT.

The circuitry includes an external audio output line with dual dry contact relay contacts for keying.
The nominal audio level is 0dbm.
This audio output includes speech from all users plus alarms.
Note the two key contacts only operate in an all-call situation in the PA system.
I.e. the user has selected all-call, or in an alarm situation.
(Alarm enabled automatically operates all zones, all-call)

TABLE 1. TYPICAL CONFIGURATION.

1 = CLOSED STRAP/SWITCH ON
O = OPEN STRAP/SWITCH OFF
X = DON'T CARE

NUMBER OF AMPS.	DIPSWITCH 7 1 2 3 4 5 6 7 8	DIPSWITCH 8 1 2 3 4 5 6 7 8	DIPSWITCH 9 1 2 3 4 5 6 7 8 A B	DIPSWITCH 10 1 2 3 4 5 6 7 8 A B	DIPSWITCH 11 1 2 3 4 5 6 7 8 A B	OUTPUT STRAPS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18	NO-TE
1	- - - 1 1 1 X X	0 0 0 0 0 0 X X	1 1 1 0 0 0 X X	0 0 0 0 0 0 X X	0 0 0 0 0 0 X X	1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0	1)
2	- - - 1 0 0 X X	0 1 1 0 0 0 X X	1 0 0 0 0 0 X X	0 1 1 0 0 0 X X	0 0 0 0 0 0 X X	1 1 0 0 0 0 0 0 1 1 1 1 0 0 0 0 0 0	2)
3	- - - 1 0 0 X X	0 1 0 0 0 1 X X	1 0 0 1 0 0 X X	0 1 0 0 1 0 X X	0 0 1 0 0 1 X X	1 1 0 0 0 0 0 0 1 1 0 0 0 0 0 0 1 1	3)

Note 1) One amplifier cover all three zones. Only entertainment A present. Entertainment possible in all zones.
Note 2) One amplifier on zone 1, one amplifier cover zone 2 and 3.
Note 3) One amplifier for each zone. Two entertainment sources. Both sources (A+B) possible in all zones.

TABLE 2. EXAMPLE.

NUMBER OF AMPS.	DIPSWITCH 7 1 2 3 4 5 6 7 8	DIPSWITCH 8 1 2 3 4 5 6 7 8	DIPSWITCH 9 1 2 3 4 5 6 7 8 A B	DIPSWITCH 10 1 2 3 4 5 6 7 8 A B	DIPSWITCH 11 1 2 3 4 5 6 7 8 A B	OUTPUT STRAPS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18	NO-TE
1	- - - 1 1 1 X X	0 0 0 0 0 0 X X	1 1 1 0 0 0 X X	0 0 0 0 0 0 X X	0 0 0 0 0 0 X X	1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0	1)
2	- - - 1 1 0 X X	0 0 1 0 0 0 X X	1 1 0 0 0 0 X X	0 0 1 0 0 0 X X	0 0 0 0 0 0 X X	1 1 0 0 0 0 0 0 0 0 0 1 1 0 0 0 0 0	2)
3	- - - 1 0 0 X X	0 1 0 0 0 1 X X	1 0 0 1 0 0 X X	0 1 0 0 1 0 X X	0 0 1 0 0 1 X X	1 1 0 0 0 0 0 0 1 1 0 0 0 0 0 0 1 1	3)

Note 1) One amplifier cover all zones. Only entertainment A present. Entertainment possible in all zones.
Note 2) One amplifier zone 1 and 2. One amplifier zone 3.
Note 3) One amp per zone. Two entertainment sources. Both sources (A+B) possible in all zones.

4.0. OPTIONAL ALARM BOARD INSTALLED.

The SPA 1500 may have an alarm tone generator board installed.
The alarm board may be the std. PCB 92100-027, or the duplicated alarm board 99100-003.
In this case the **ST 20** is to be mounted.
The **ST 21** is removed.

5.0. OPTIONAL DING-DONG BOARD INSTALLED.

The SPA 1500 may have a ding-dong board installed.
PCB 88100-014.
In this case the **ST 19** is to be mounted.
The **ST 21** is mounted.

6.0. AUTOMATIC GAIN CONTROL (AGC) DISABLE.

The AGC may be disabled for special purposes.
The **ST 22** is installed in this case.

7.0. ENTERTAINMENT MUTE.

If the SPA system is single amplifier based the entertainment zone set-up must be disabled during PA paging. The **ST 23** is removed.
If the system includes one amplifier per zone the entertainment and PA is separated, and simultaneous operation is possible. The **ST 23** is mounted.
If one of the amplifiers is combined in two zones the **ST 23** is removed.

8.0. CAR CASSETTE RADIO/ CD PLAYER

The SPA 1500 may be delivered with an optional car cassette radio / CD player.
This unit serves as the entertainment source A in the system.

9.0. POWER SUPPLY.

The SPA 1500 operates on 24 VDC supply. The system board has two power line inputs. One is supply directly from the ships batteries, the other from the optional net adapter. (Option)
The AC supply may span from 110 to 230 VAC without having to do any re-wiring in the power supply.

10.0. DC CONVERTER.

The car cassette radio is operating on 12 VDC. This voltage is supplied from the DC converter. (Option)

11.0. ENTERTAINMENT CONTROL.

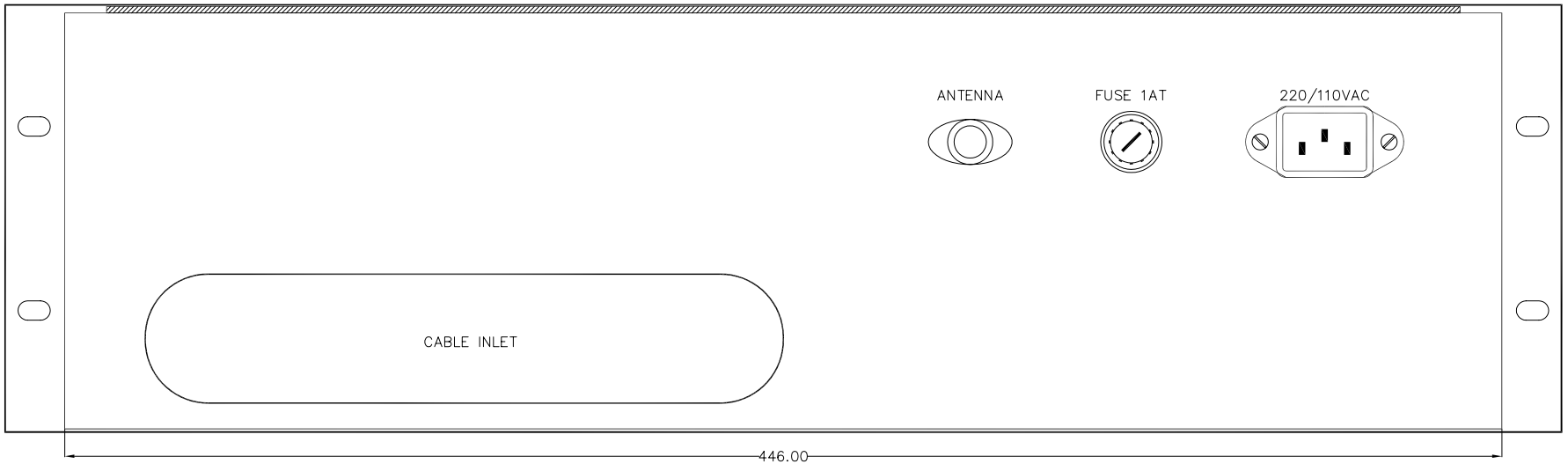
The entertainment sources is controlled by means of the entertainment control switches on the front at the SPA 1500. There are three toggle switches for the A source zoning configuration, and three toggle switches for the B source zoning configuration.

12.0. STATUS LEDS.

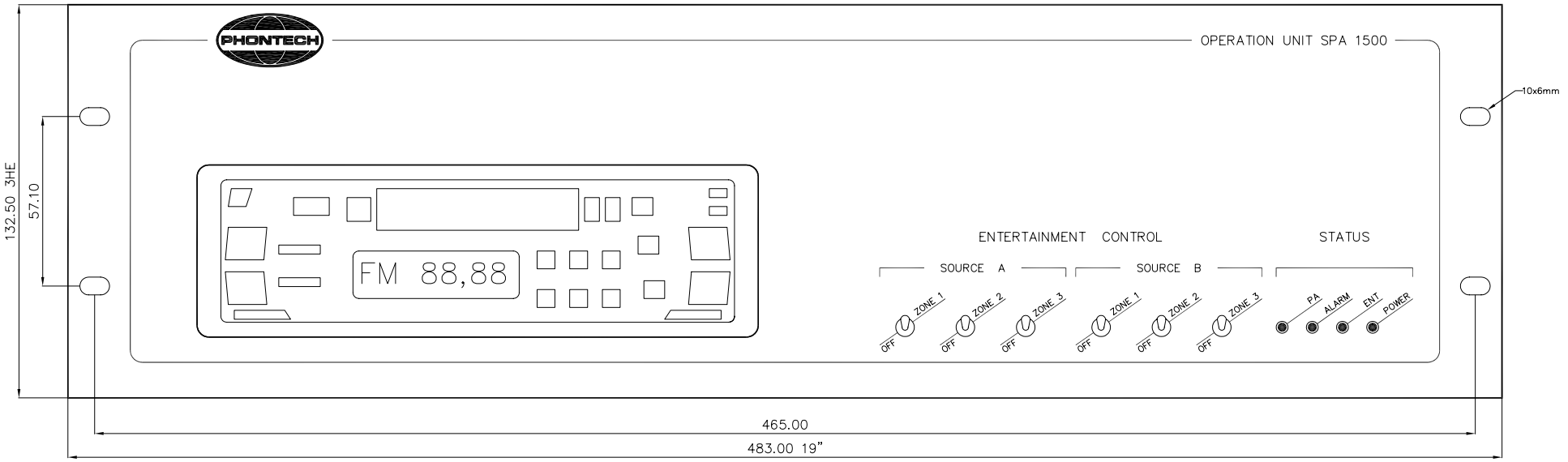
The system status is displayed on the STATUS part of SPA 1500.

Led for supply status:	POWER led. Green colour means OK. Red colour means mains (110-220VAC) failure.
Led for PA activity:	PA led. Illuminates when the system is active in PA mode. (Paging from users/ PABX etc.)
Led for entertainment:	ENT. led. Illuminates when any of the six entertainment switches is active.
Led for alarm.	ALARM led. Illuminates if the alarm is active. (Alarm is optional)

REAR VIEW



FRONT VIEW



NOTES:
- DEPTH OF UNIT: 281,00 EXCL. PLUG/FUSE.
- CHASSIS: ALUDINE-TREATMENT.
- RADIO WITH CASSETTE OR CD-PLAYER IS OPTION.

EQUIPMENT DATA:

MANUFACTURER	: PHONTECH AS.	FIXING DETAILS	: 4pcs. M5 BOLT.
MODEL/TYPE	: OPERATION UNIT.	ACCESS	: TOP/REAR.
RACK/BOX SUPPL.	: PHONTECH AS.	CABLE ENTRY	: REAR.
RACK/BOX TYPE	: N.A.	GLAND TYPE	: N.A.
MATERIAL	: ALUMINIUM.	PROTECTION IP	: IP-20.
COLOUR	: RAL 9005.	POWER SUPPLY	: 24VDC/220VAC.
WEIGHT OF UNIT	: APP. 5,00Kg.	POWER CONSUMP.	: 100W.
MOUNTING	: RACK/CONSOLE.	HEAT DISSIPATION	: N.A.

REV No.	ISSUE DATE	REASON FOR ISSUE	PREPARED	CHECKED	APPROVED
1	2000.10.16	CHANGE ORDER No. 803	R.F.	E.D.	TLy
0	96.10.08	AS BUILT.	R.F.	E.D.	TLy

TITLE: SPA SYSTEM OPERATION UNIT.
SPA-1500.
MECHANICAL LAYOUT.

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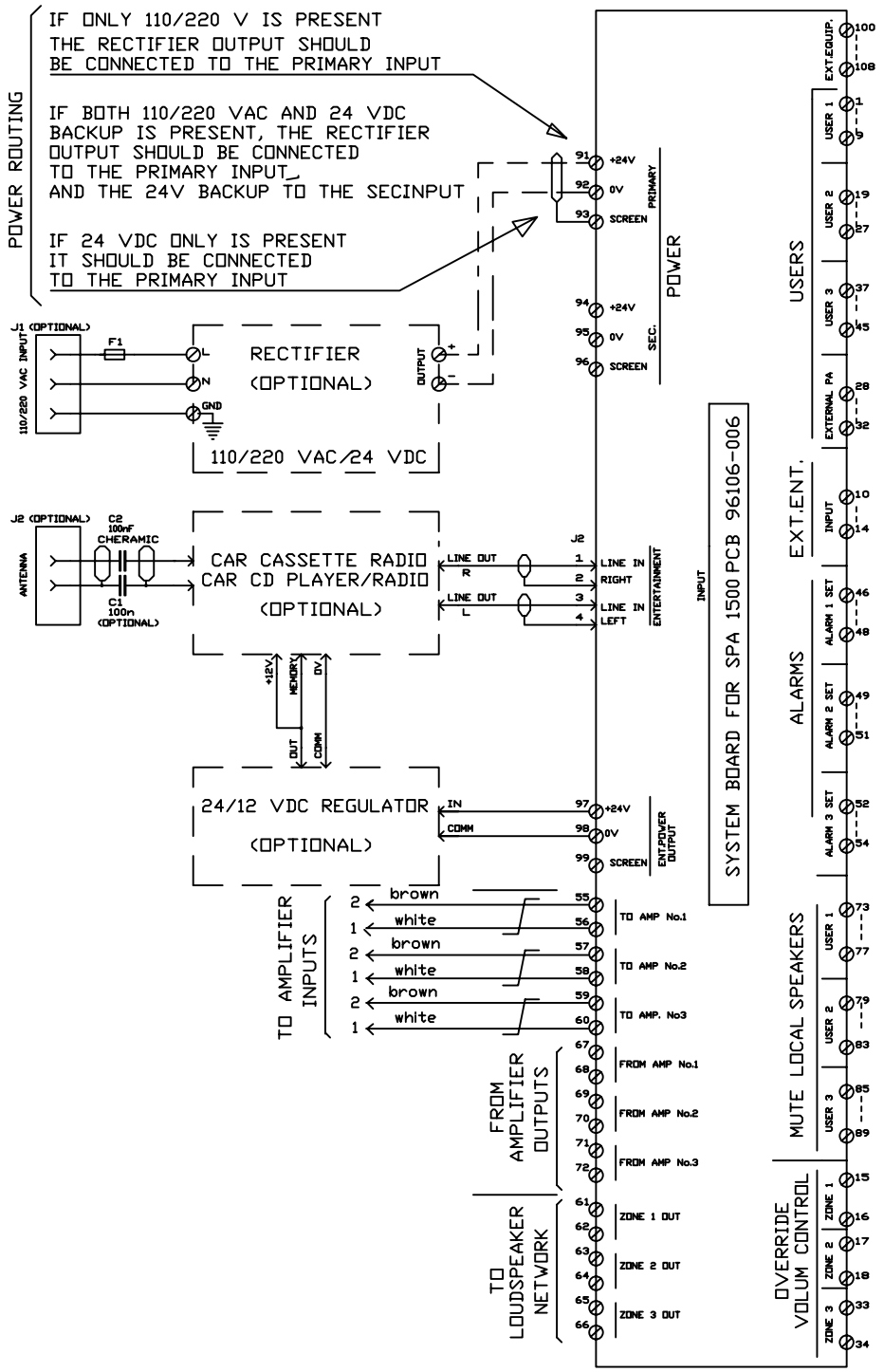
SIZE: A2 | UED No: 92
DOC. No: 96106-001-ML
FILE NAME: 96106-001-ML.DWG



REV No.	ISSUE DATE	REASON FOR ISSUE	PREPARED	CHECKED	APPROVED
4	24.06.2005	CHANGE ORDER No. 1023	ASk	TBA	ASk
3	24.03.2001	CHANGE ORDER No. 842	AHJ	AHJ	ASk
2	06.02.1998	CHANGE ORDER No. 689	TLy	TLy	ASk
1	06.02.1997	CHANGE ORDER No. 636	TLy	TLy	ASk
0	02.10.1996	AS BUILT.	TLy	TLy	ASk

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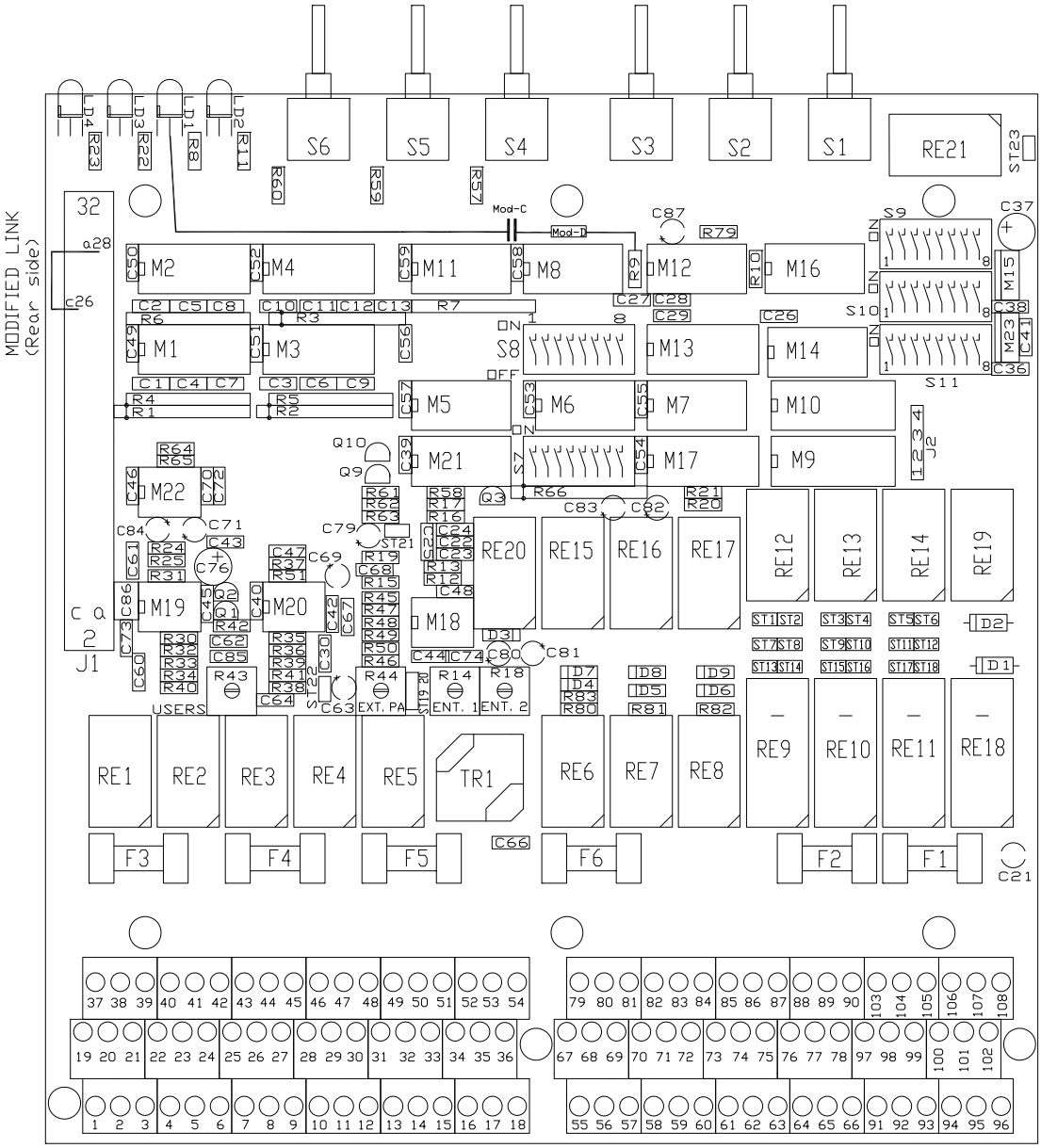
TITLE: PUBLIC ADDRESS SYSTEM.
SPA-1500.
OPERATION UNIT.
INTERNAL WIRING.

SIZE: A3 | UED No: 92
DOC. No: 96106-001-IW
FILE NAME: 96106-001-IW.DWG



REV No.	ISSUE DATE	REASON FOR ISSUE	PREPARED	CHECKED	APPROVED
3	2004.11.08	REVISION, EM 1007	ASk	TBA	ASk
2	2003.11.25	REVISION, EM 972	ASk	TBA	ASk
1	1997.03.06	REVISION, EM 636	tly	TBA	tly
0	1997.02.05	FINAL DOCUMENTATION	tly	TBA	tly

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TITLE: SYSTEM BOARD FOR OPERATION UNIT 1500 Layout

SIZE: A3 | UED No: 92

DOC. No: 96106-006-LO

FILE NAME: 96106-006-LO.DWG

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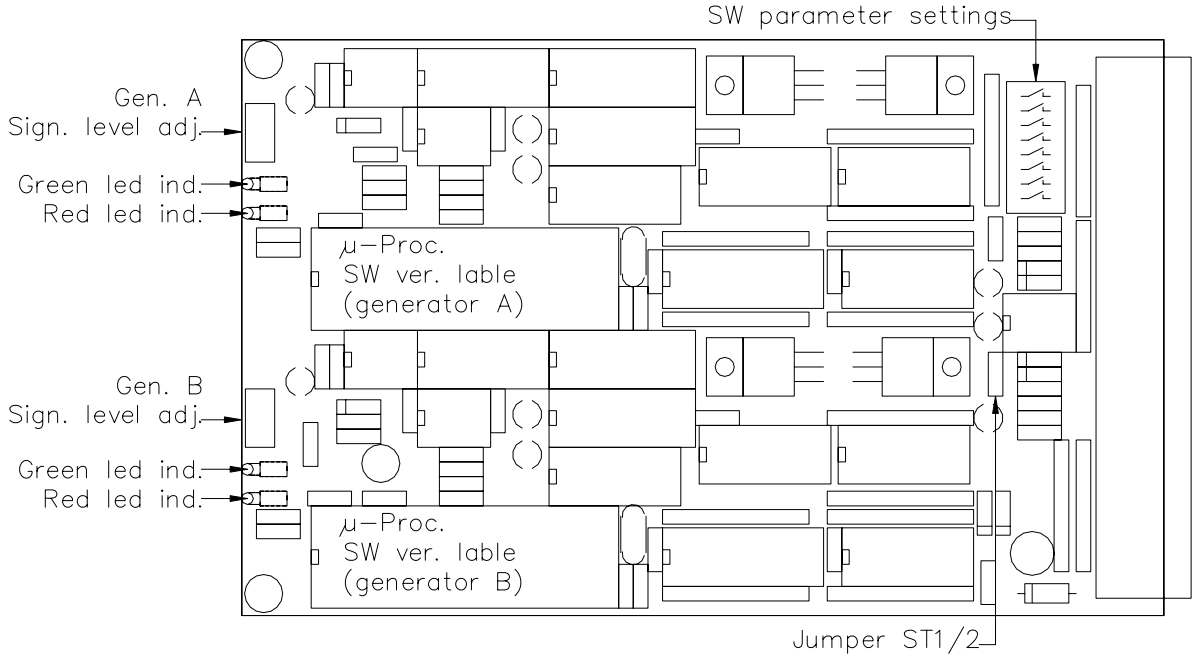
Doc.No.: 99100-003-CA

CARD DESCRIPTION
DOUBLE ALARM GENERATOR WITH SURVEILLANCE
99100-003



REV No:	ISSUE DATE	REASON FOR ISSUE	PREPARED	CHECKED	APPROVED
2	19.08.2009	REVISION, EM 1210	CD	TBA	CD
1	30.03.07	REVISION, EM 1089	ASk	TBA	Ask
0	23.11.99	FINAL DOCUMENTATION	ASk	Tly	Ask

TITLE: DOUBLE ALARM GENERATOR WITH SURVEILLANCE

Card Description

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SIZE: --	**UED no: M009**
DOC no: 99100-003-CD	
FILE NAME: 99100-003-ca.doc	

GENERAL FACILITIES:

The DOUBLE ALARM GENERATOR WITH SURVEILLANCE – 99100-003 is an alarm generator module comprising 2 totally independent generator sections.
The digital in- and outputs as well as the primary audio output are however common to both generators.
Even so they are isolated in such way they will not interfere with normal operation in case of any single accident/failure.
The generator is fully microprocessor controlled and thus very flexible.
It can be pre-programmed to most requirements.
In many applications it can also be user-configured to meet the required performance.

In addition to be full duplication of the generator it is equipped with various supervision facilities:

- Input power supply-supervision guard below 15-18 V. (Software processed).
- Supervision of the opposite generator operation voltage, above 4.6 V. (Software processed).
- Supervision of the signal output voltage, above 325 mV. Software processed).
- Supervision of the generators own operation voltage, above 4.5 V. This circuit will also protect the circuit from unintentional stops caused by power supply glitches. (Hardware processed).
- A watchdog circuit is monitoring the microprocessor and software performance in order to avoid any lockups. (Hardware processed – software trigged).

Level adjustment:
The signal output voltage is a common passive summarisation output for both signal generators. Both generator modules have separate level adjustment ranging between 0-1.5 V RMS. In order to avoid fault conditions caused by the output signal supervision circuit, the level must always be adjusted above 350mV.

JUMPER:
The jumper ST1/2 selects external I/O pull-up voltage between 24V and 5V. The normal setting for Phontech equipment is ST1 – 24V. In special applications ST2 – 5V pull-up voltage is necessary. The setting is dependent of the external logic level.

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Doc.No.: 99100-003-CA

LED indicators
Led status conditions:
○ Dark / no light
✳ Slow flashing
✹ Fast flashing
● Steady light

Green LED	Red LED	Status
○	○	Power off – no operation
✳	○	Idle – status OK
✳	✳	Idle – blinking generator OK – opposite generator power failure The remaining generator is still working, but the module requires service
✹	✹	Idle – generator OK – main power supply failure / below 15-18V The generator is still functional – the power source must be checked
●	○	The alarm module is generating an alarm tone, section OK
○	✹	The alarm module is generating an alarm tone, but the output level from the displaying section is below the acceptable limit. Thus, the alarm section has gone to idle and the other section has taken care of the functionality. **The generator may still work if the other section is displaying OK. Else not. Service is required.**
●	●	The alarm module is trying to generate an alarm tone. The remaining section, after primary section fail, is outputting a signal level below the acceptable limit, but is still trying to output. **The generator is not working and immediate service is required.**
○	●	Idle – the generator module is faulty. Service is required

SOFTWARE:
Phontech will always configure the Alarm generator according to the requirement. Due to the full flexibility of the functionality it is possible to generate custom designed functionality as well as standard.
Within each software version there might be DIP-switch parameter settings available. The following list describes the standard software facilities.

<table>
<tr><th>Prog: Ver.</th><th colspan="3">Description:</th></tr>
<tr><td rowspan="4">1.0
1.1
1.2
1.3</td><td colspan="3">STANDARD ALARM FOR SPA 1500:
• 1. Priority alarm = GENERAL ALARM – 7 short bursts (1 sec. ON / 1 sec. OFF) followed by 1 long burst (7 sec.). Tone - 1 kHz
• 2. Priority alarm = FIRE ALARM (ref. DIP SW. Table below:</td></tr>
<tr><td>DIP SW:[1]
1 2 3 4 5 6 7 8</td><td colspan="2">Facility</td></tr>
<tr><td>0 x x x x x x x</td><td colspan="2">Continuous tone 800Hz</td></tr>
<tr><td>1 x x x x x x x</td><td colspan="2">Bell ring tone (1 sec ON / 1 sec. OFF)</td></tr>
<tr><td>1.3</td><td>x # # x x x x x</td><td colspan="2">Ding-Dong tone volume setting relative to alarm / overall volume adjustment:
<table><tr><th>DIP SW 2</th><th>DIP SW 3</th><th>Volume level</th></tr><tr><td>1</td><td>1</td><td>0 dB</td></tr><tr><td>0</td><td>1</td><td>-6 dB (factory default)</td></tr><tr><td>1</td><td>0</td><td>-12 dB</td></tr><tr><td>0</td><td>0</td><td>-18 dB</td></tr></table></td></tr>
</table>

[1] DIP Switch setting: 0=OFF / 1=ON / x = Don't care / # = see details

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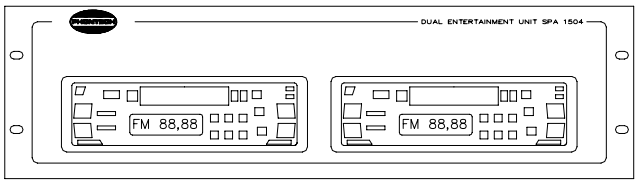
Doc.No.: 96106-018-DE

DUAL ENTERTAIMENT UNIT
SPA-1504
DESCRIPTION



REV No:	ISSUE DATE	REASON FOR ISSUE	PREPARED	CHECKED	APPROVED
1	19.08.2009	REVISION, EM 1209	CD	TBA	CD
0	12121997	FINAL DOCUMENTATION.	Tly	ASk	TBA

TITLE: PUBLIC ADDRESS SYSTEM.
DUAL ENTERTAINMENT UNIT, SPA-1504.
DESCRIPTION.

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SIZE: A4	**UED no: 92**
DOC no: 96106-018-DE	
FILE NAME: 96106-018-DE.DOC	

INTRODUCTION:

The SPA-1504 Dual Entertainment Unit was designed to operate the Phontech SPA-system. Together with the SPA-1510 or SPA-1530 it will be a complete public address and entertainment system.
The compact design makes it easy to install.
The mounting is in standard 19” rack or console.

GENERAL DESCRIPTION:

The SPA-1504 is in maxversion comprising the following parts:

-2 pcs. Car cassette radio/CD players.
-Power supply for 110>230 VAC (option).
-DC converter for the car radios/CD players.
-Dual antenna input.

OPERATION:

The entertainment sources may be the radio, the cassette player or the CD player.
The type of car receiver installed is project dependent.

RADIO SOURCE:

Turn the radio on and tune to the desired station. The output level is adjustable by means of the volume control buttons/knob.
Please see the user manual for the attached car radio model for further information.

MUSIC CASSETTE SOURCE:

This source is comprehensive when pre-recorded public address message is to be broadcasted over the loudspeakers. For entertainment purposes this also can give around the clock music, by means of the auto reverse function.
Please see the user manual for the attached car radio model for further information.

CD PLAYER SOURCE:

High quality entertainment audio sound is accomplished when using the CD-player. Some players has random play. Around the clock entertainment is reached by enabling the replay function at the CD-player.
Please see the user manual for the attached car radio model for further information.

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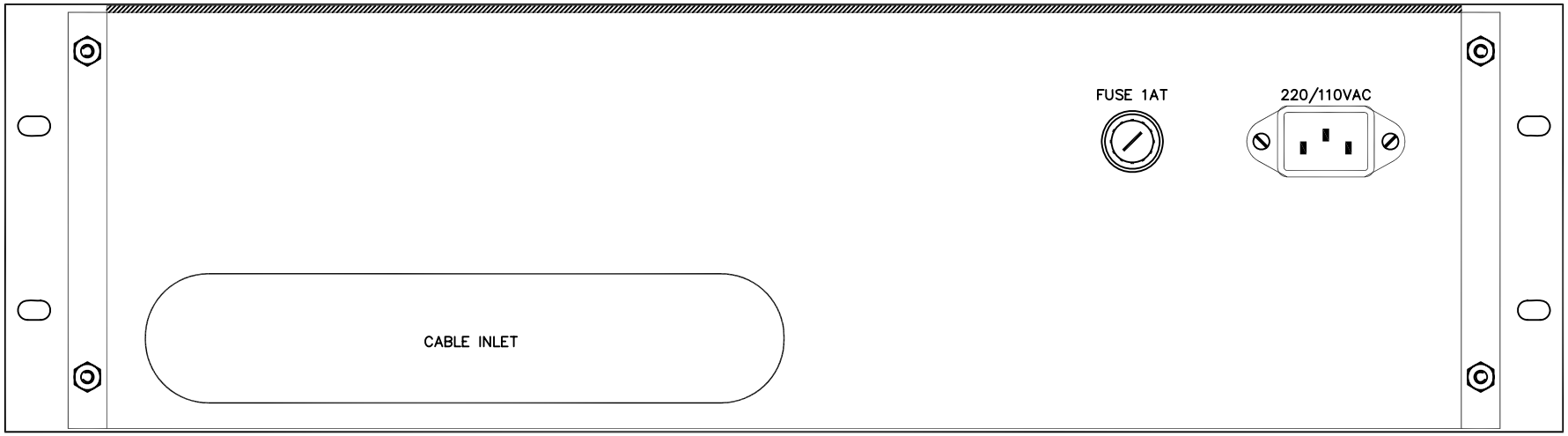
UAB Jotron

Doc.No.: 96106-018-DE

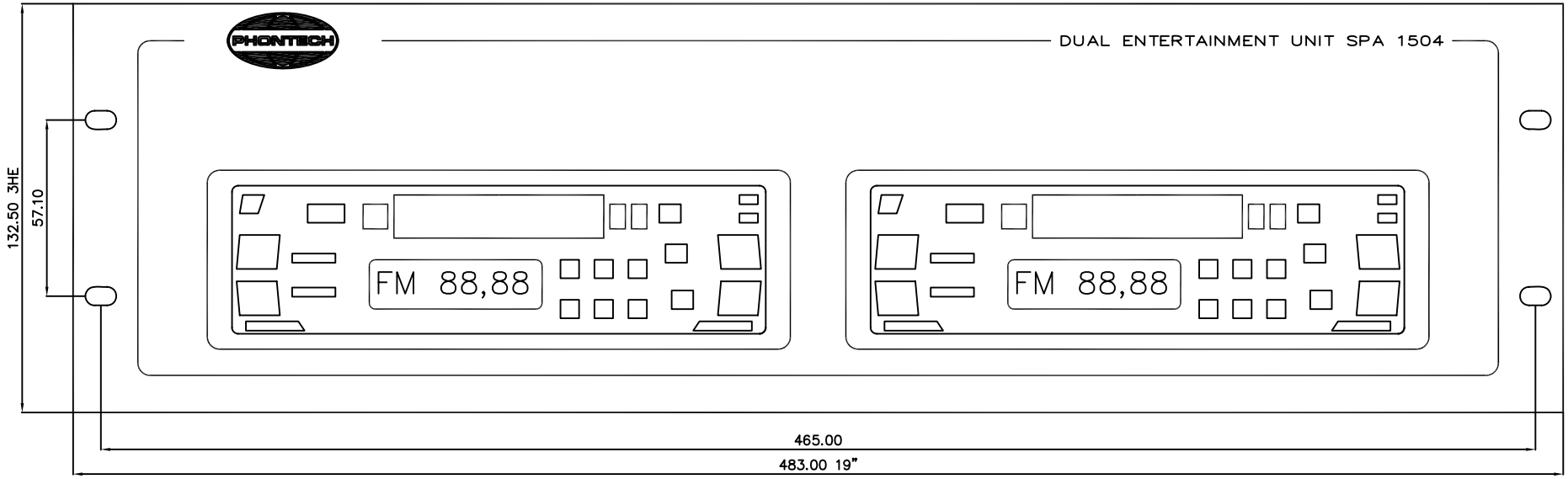
TECHNICAL DATA:

-Operation voltage:	24 VDC. (230 VAC optional).
-Current drain:	3A max.
-Capacity:	two car radio/CD/cassette players.
-Line out audio level:	500-700 mV.
-Mounting:	3HE/19” rack or console mounting.
-Dimension:	W: 483 / H: 132,50 / D: 282 mm.
-Weight:	<4 kgs.

REAR VIEW



FRONT VIEW



NOTES:
- DEPTH OF UNIT: 281,00 EXCL. PLUG/FUSE.
- COLOUR: RAL 9005 BLACK DULL.
- SILKSCREEN: WHITE.
- CHASSIS: ALUDINE-TREATMENT.

REV No.	ISSUE DATE	REASON FOR ISSUE	PREPARED	CHECKED	APPROVED
0	19.11.1997	AS BUILT.	R.F.	ASk	ASk

TITLE: DUAL ENTERTAINMENT UNIT.
SPA-1504.
MECHANICAL LAYOUT.

PHONTECH

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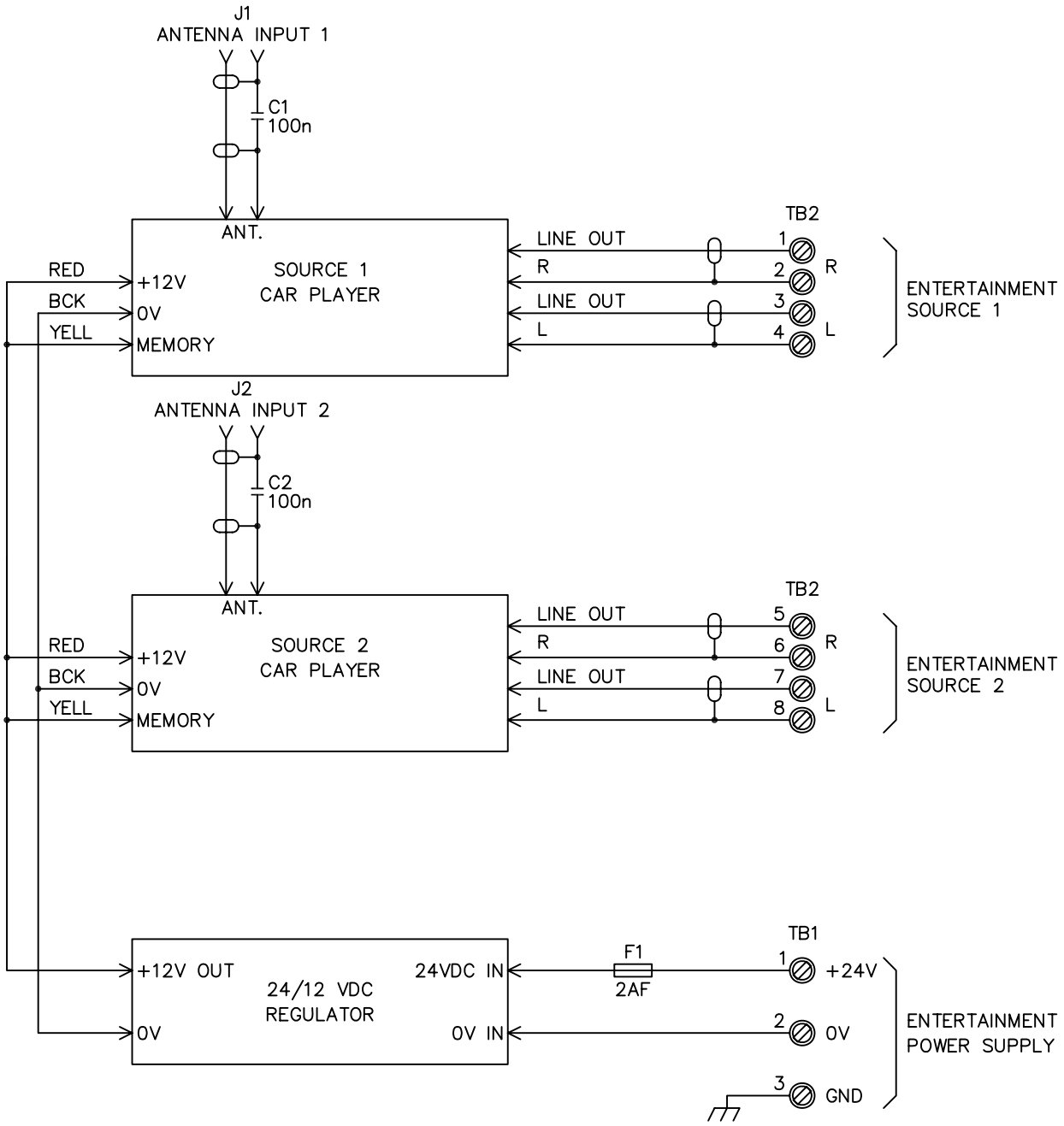
SIZE: A2 | UED No: 92
DOC. No: 96106-018-ML
FILE NAME: 96106-018-ML.DWG



REV No.	ISSUE DATE	REASON FOR ISSUE	PREPARED	CHECKED	APPROVED
0	08.10.1996	AS BUILT.	TLy	ASk	ASk

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TITLE: SPA SYSTEM.
DUAL ENTERTAINMENT UNIT.
SPA-1504.
INTERNAL WIRING.

SIZE: A4	UED No: 92
DOC. No: 96106-018-IW	
FILE NAME: 96106-018-IW.DWG	

Jotron AS
Jotron UK Ltd.
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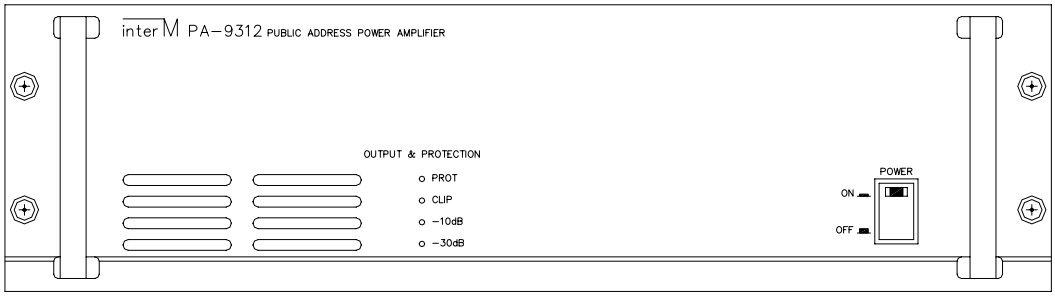
Jotron Consultas AS
Jotron Asia Pte. Ltd.
Jotron USA, Inc.
UAB Jotron

Doc.No.: INTERM-120-240

PUBLIC ADDRESS
POWER AMPLIFIER
PA 9312 and PA 9324



1	19.08.2009	REVISION EM 1209	CD	TBA	CD
0	15.06.1998	FINAL DOCUMENTATION.	R.F.	A.I.	ASk
REV No:	ISSUE DATE	REASON FOR ISSUE	PREPARED	CHECKED	APPROVED

TITLE: POWER AMPLIFIER, INTERM.
PA 9312 & PA 9324.
INSTALLATION MANUAL.

Jotron AS
Jotron UK Ltd.
Jotron Phontech AS
Jotron Consultas AS
Jotron Asia Pte. Ltd.
Jotron USA, Inc.
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SIZE: A4	**UED no:**
DOC no: INTERM-120-240	
FILE NAME: INTERM-120-240.DOC	

Unpacking and Installation.

Although it is neither complicated to install nor difficult to operate your PA–amplifier, a few minutes of your time is required to read this manual for a properly wired installation and becoming familiar with its many features and how to use them.
Please take a great care in unpacking your amplifier and do not discard the carton and other packing materials. They may be needed when moving your set and are required if it ever becomes necessary to return your set for service.
Never place the unit near radiators, in front of heating vents, in excessively humid or dusty location to avoid early damage and for your years of quality use.
Connect your complementary components as illustrated in the following page.

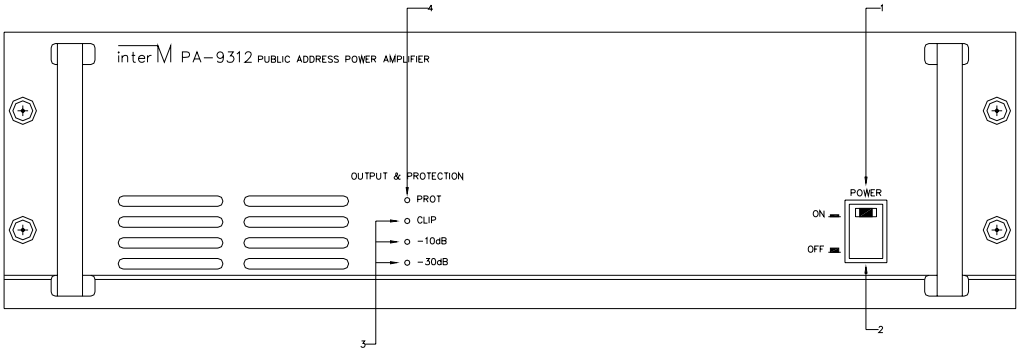
Features.

* THERMAL PROTECTION & AUTOMATIC IDLING CIRCUITRY.
  To insure stability and reliability against over-current and over-heating, thermal protection circuitry is provided. In addition, automatic idling circuit is provided to protect against thermal run-away.

* BALANCED INPUT.
  A balanced input is provided to reduce hum pick up from a long distance Input cable and to avoid ground loop problem when you build the system.

* GAIN ADJUSTMENT.
  You can adjust the input gain from –12dB to 0dB (1V) by using of input gain adjust control.

* USE OF EMERGENCY BATTERY.
  You can operate the PA amplifier by using emergency battery for unexpected AC power failure.



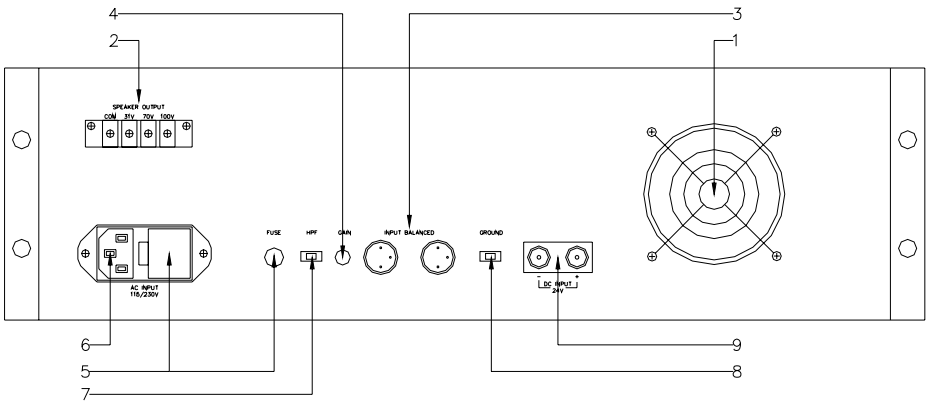
1. POWER INDICATING LED.
   This LED indicates power is turn ON.

2. POWER SWITCH.
   Pressing this switch to ON will make the power indicating LED ON and supply the power to unit.

3. OUTPUT LEVEL INDICATORS.
   These led indicates the output level of this amplifier. Be sure not to operate the unit with the clip led on continuously (RED).

4. PROTECTION INDICATOR.
   This led indicates the condition of the protection circuit. When the protection led is “ON” the amplifier is not operating normally (overheating and limiting), please check the input/output condition of the amplifier.

Doc.No.: INTERM-120-240



1. FAN.
   The fan should be kept free of all obstructions and be accessible to Cool fresh air when possible. It is important that the fan be used in a dust free environment.

2. SPEAKER OUTPUT TERMINAL.
   These terminals are for connection of speaker line to deliver power output to speakers. Impedance (voltage) of 4 ohm: 25V, 70V and 100V are provided for convenience. In any case, use the speakers whose combined impedance is equal to or higher than the rated output impedance of amplifier.

Model	4ohms	24V	70V	100V
PA-9312	22V	5.2ohm	42ohm	83ohm
PA-9324	31V	2.6ohm	21ohm	42ohm

*100V or 25V can be seleted optionally.

3. INPUT JACKS.
   These input jacks and terminals are for the balanced input signal. You can connect amplifiers in parallel by using XLR jack.

4. LEVEL ADJUST CONTROL.
   This control is for adjusting the level of amplifier from – 12dB to 0dB with reference input sensitivity of 0dB (1V). Rotating the control clockwise increases the level and counter clockwise decreases the level.

5. FUSE HOLDERS, AC AND DC.
These fuse holders contain AC and DC fuses. Replace them with Same type fuse when they are blown out. If they continuously blow, stop replacing fuses and refer servicing to qualified personel.

6. AC INLET.
This terminal is connected AC input cord.

7. HIGH-PASS FILTER SWITCH.
This switch is for activating the High-pass Filter circuit, to protect Speakers from excessive low frequency power demands. The –3dB frequency of the High-pass Filter is 400Hz.

8. EARTH LINK SWITCH.
This slide switch provides for separation of “safety” earth and “signal” earth to prevent from hum loops.

9. DC INPUT TERMINALS.
These terminals are for connecting DC power supply of battery, connect red colour terminal to positive lead of battery and black colour one to negative lead battery.

SPECIFICATIONS

Model: PA-9324

ELECTRICAL

Power output (THD 1%)……240W (RMS)
2.6 ohm (25V)
4 ohm (31V)
21 ohm (70V)
42 ohm(100V)
Frequency Response (+1/-3dB)……..70Hz to 20KHz
THD at 1 KHz, Rated Output……Less than 1%
HPF……..-3dB at 400Hz
Signal to Noise Ratio……Better than 95dB
Input Sensitivity/Impedance……1V/10K ohm Balanced
Input Level Adjustment……..-12dB to 0dB

GENERAL

Power source…… AC 115V (110/220) or 230V (220/240)
50Hz/60Hz, DC 24V
Dimensions.....W:482 x H:132 x D:280
Weight.....19Kg.

Note: Specifications and design subject to change without notice for improvements.

SPECIFICATIONS

Model: PA-9312

ELECTRICAL

Power output (THD 1%)……120W (RMS)
4 ohm (25V)
5.2 ohm (31V)
42 ohm (70V)
83 ohm(100V)
Frequency Response (+1/-3dB)……..70Hz to 20KHz
THD at 1 KHz, Rated Output……Less than 1%
HPF……..-3dB at 400Hz
Signal to Noise Ratio……Better than 95dB
Input Sensitivity/Impedance……1V/10K ohm Balanced
Input Level Adjustment……..-12dB to 0dB

GENERAL

Power source…… AC 115V (110/220) or 230V (220/240)
50Hz/60Hz, DC 24V
Dimensions.....W:482 x H:132 x D:280
Weight.....14Kg.

Note: Specifications and design subject to change without notice for improvements.

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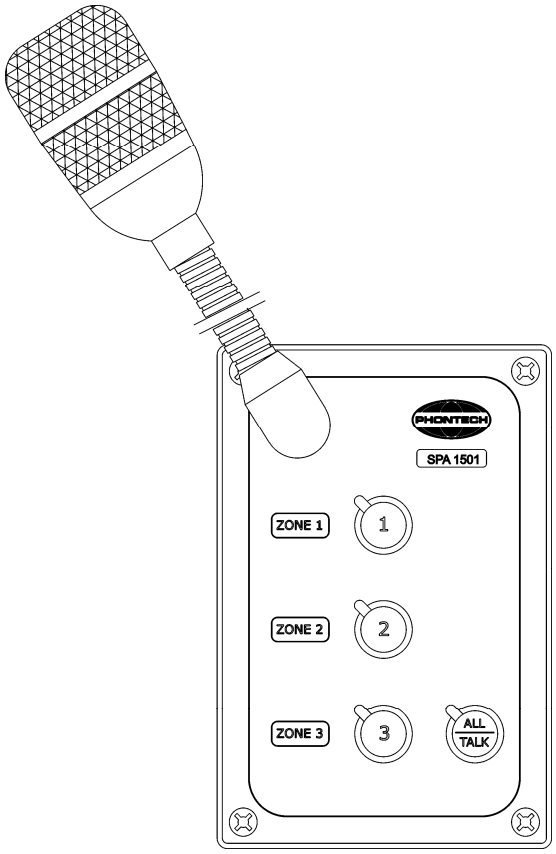
Doc.no : 08100-001-DE.doc

PA CONTROL UNIT
SPA 1501

WITH GOOSENECK MICROPHONE



0	2008.10.28.	FINAL DOCUMENTATION	CD		
REV No:	ISSUE DATE	REASON FOR ISSUE	PREPARED	CHECKED	APPROVED

TITLE: **PA CONTROL UNIT, SPA 1501.**
WITH GOOSE NECK MICROPHONE.
VERSION 05827
DESCRIPTION.

Jotron AS
Jotron UK Ltd.
Jotron Phontech AS
Jotron Consultas AS
Jotron Asia Pte. Ltd.
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SIZE: A4	**UED no: 92**
DOC no: 08100-001-DE	
FILE NAME: 08100-001-DE	

GENERAL DESCRIPTION.

The SPA 1501 is a PA control unit in the SPA system. The SPA 1501 contains all the necessary electronics/logic needed to obtain the function to control the SPA system.
The SPA 1501 is designed for flush or wall mounting.
A wall mounted back box (01100-006) optional.

- Mic. line audio level: 5mV.
- Led indicators for all keys.
- Backlight leds for area text.
- Replaceable zone description text.
- Withstands ruff and moist environment.

POWER REQUIREMENTS:

Operating power (included in the SPA1500 connection): 24VDC / 100mA

CABLE REQUIREMENTS:

The signal cable must be twisted pair with outer screen.
Number of pairs: 4
Conductor area: 0.75mm^2

MOUNTING:

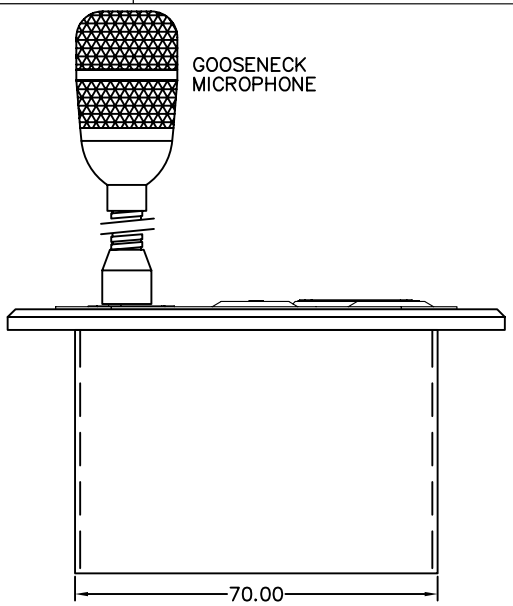
SPA 1501 PA control unit is flush mounted in standardized dimension ship consoles.
For other flush mounting: Cut-out dim. 90 x 123 mm.
Cable inlet is from behind.
To ease the cable termination the screw terminals are plug-in type.

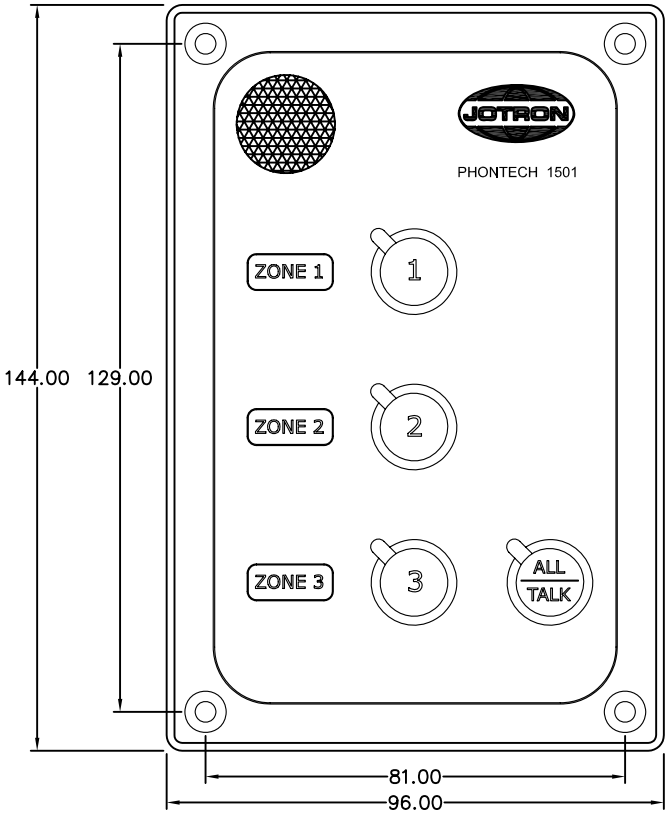
PAGING:

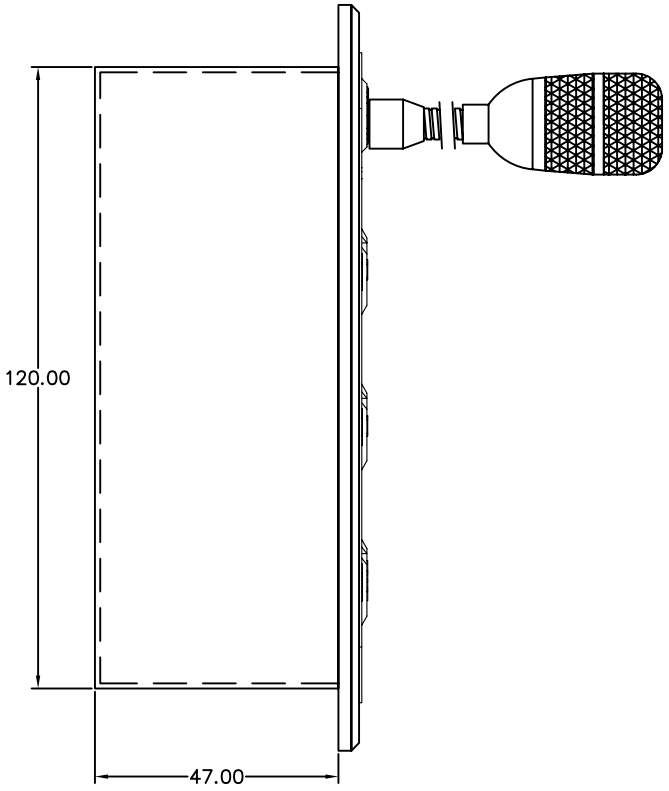
Paging may be performed in any of the three zones, or all zones.
Press the TALK key on the handheld microphone and speak clearly and directly into the microphone.

AUTOMATIC AND MANUAL ZONE SELECTION.

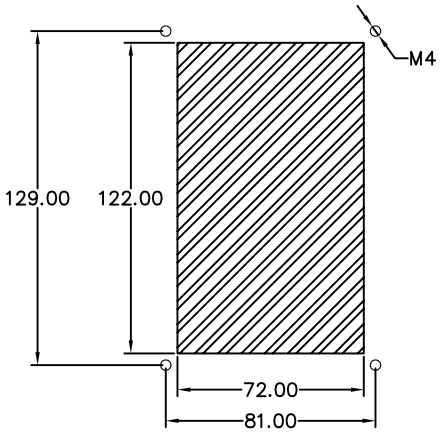
The PA control unit, SPA 1501 has three zone keys plus one TALK/ALL key.
When one of the zone keys is activated, the indicator led illuminates full light.
If none of the zones is active (half-light), and the TALK/ALL key is operated, the system automatically goes into ALL CALL mode.
I.e. all the zone key indicator leds illuminates full light and the message is distributed in ALL ZONES.







CUT–OUT AND MOUNTING DIMENSIONS.



EQUIPMENT DATA:

MANUFACTURER	: JOTRON PHONTECH AS.	FIXING DETAILS	: 4pcs. M4 BOLT.
MODEL/TYPE	: CONTROL UNIT.	ACCESS	: REAR.
RACK/BOX SUPPL.	: JOTRON PHONTECH AS.	CABLE ENTRY	: REAR.
RACK/BOX TYPE	: CONSOLE MOUNTED.	GLAND TYPE	: NA.
MATERIAL	: ALUM./STEEL.	PROTECTION IP	: IP–22.
COLOUR	: RAL 9005/ALUM.	POWER SUPPLY	: FROM CENTRAL.
WEIGHT OF UNIT	: APP. 1,50Kg.	POWER CONSUMP.	: NA.
MOUNTING	: TO CONSOLE.	HEAT DISSIPATION	: NA.

REV No.	ISSUE DATE	REASON FOR ISSUE	PREPARED	CHECKED	APPROVED
01	19.05.2011	REVISION, EM 1383	ASK	TBA	ASK
0	03.09.2008	FINAL DOCUMENTATION	CD		ASK

TITLE: 1501 SPA CONTROL UNIT.
VERSION 05827.
MECHANICAL LAYOUT.

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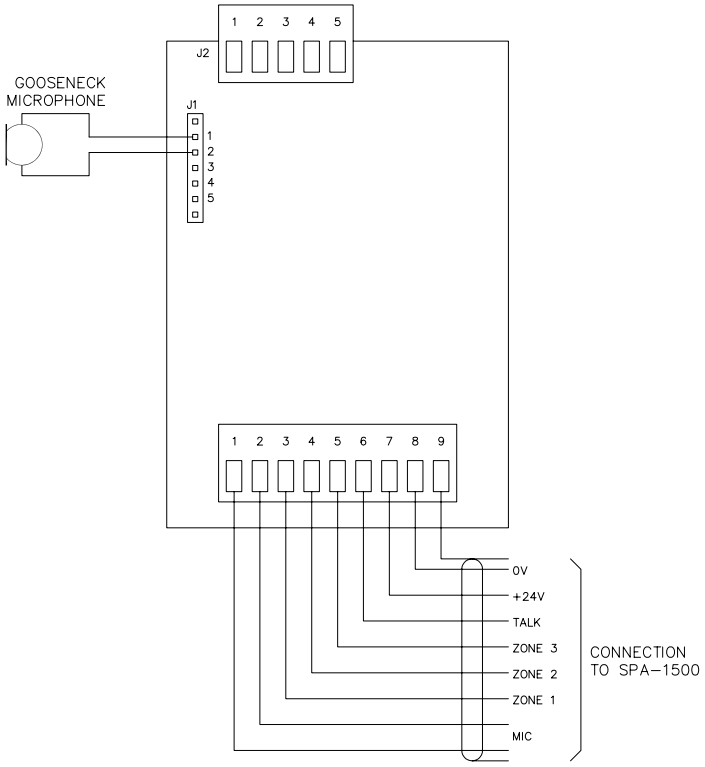
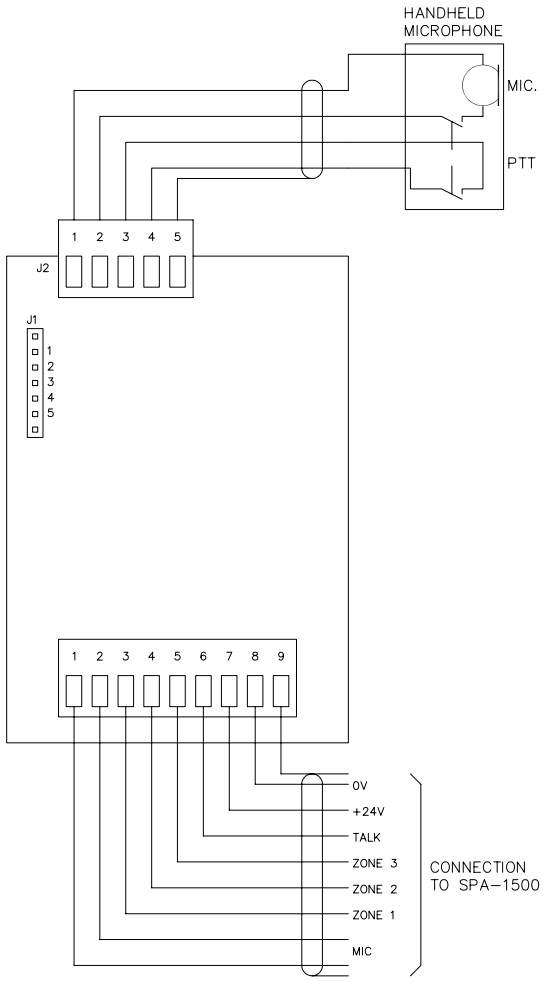
SIZE: A3 | UED No:
DOC. No: 08100–001–ML
FILE NAME: 08100–001–ML.DWG

STANDARD UNIT



OPTIONAL: HANDHELD MICROPHONE CONNECTION



REV No.	ISSUE DATE	REASON FOR ISSUE	PREPARED	CHECKED	APPROVED
1	97.03.06	REVISION EM–636	TLy	TBA	ASk
0	97.01.27	AS BUILT.	TLy	TBA	ASk

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TITLE: SPA SYSTEM, CONTROL UNIT
SPA–1501.
INTERNAL WIRING.

SIZE: A3 | UED No: 92

DOC. No: 96106–002–IW

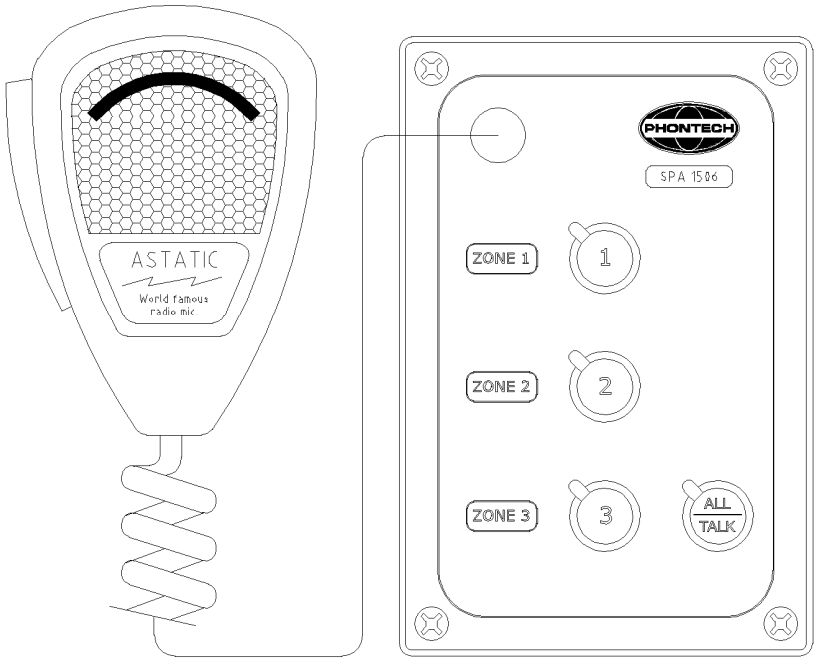
FILE NAME: 96106–002–IW.DWG

Jotron AS
Jotron UK Ltd.
Jotron Phontech AS
Jotron Consultas AS
Jotron Asia Pte. Ltd.
Jotron USA, Inc.
UAB Jotron

Doc.No.: 08100-002-DE

PA CONTROL UNIT
SPA 1506

WITH HANDHELD MICROPHONE



0	2008.10.28	FINAL DOCUMENTATION	CD		
REV No:	ISSUE DATE	REASON FOR ISSUE	PREPARED	CHECKED	APPROVED

TITLE: PA CONTROL UNIT, SPA 1506.
WITH HANDHELD MICROPHONE.
VERSION 05827
DESCRIPTION.

Jotron AS
Jotron UK Ltd.
Jotron Phontech AS
Jotron Consultas AS
Jotron Asia Pte. Ltd.
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SIZE: A4	**UED no: M025**
DOC no: 08100-002-DE	
FILE NAME: 08100-002-DE	

GENERAL DESCRIPTION.

The SPA 1506 is a PA control unit in the SPA system. The SPA 1506 contains all the necessary electronics/logic needed to obtain the function to control the SPA system.
The SPA 1506 is designed for flush or wall mounting.
A wall mounted back box (01100-006) optional.

- Mic. line audio level: 5mV.
- Led indicators for all keys.
- Backlight leds for area text.
- Replaceable zone description text.
- Withstands ruff and moist environment.

POWER REQUIREMENTS:

Operating power (included in the SPA1500 connection): 24VDC / 100mA

CABLE REQUIREMENTS:

The signal cable must be twisted pair with outer screen.
Number of pairs: 4
Conductor area: 0.75mm^3

MOUNTING:

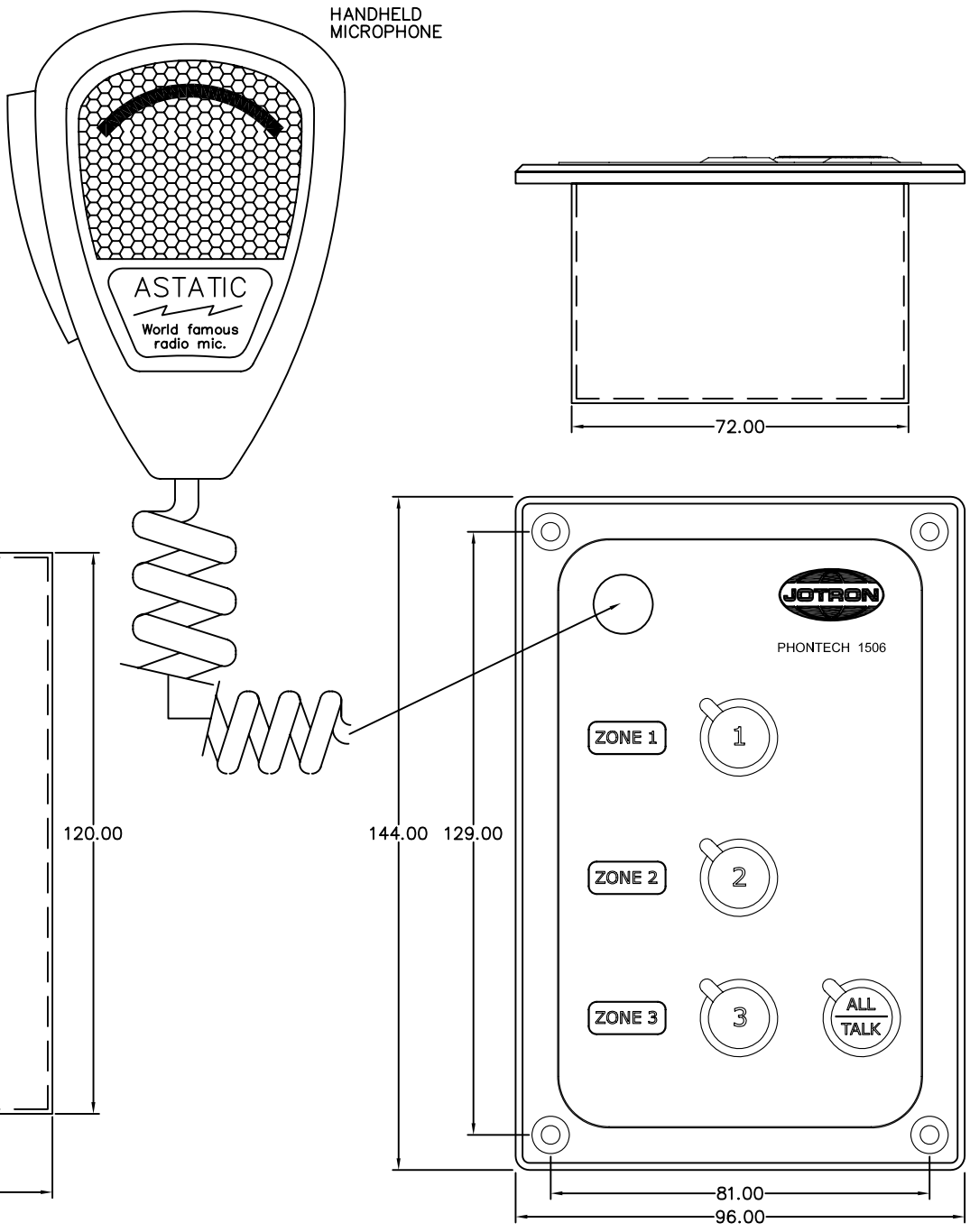
SPA 1506 PA control unit is flush mounted in standardized dimension ship consoles.
For other flush mounting: Cut-out dim. 90 x 123 mm..
Cable inlet is from behind.
To ease the cable termination the screw terminals are plug-in type.

PAGING:

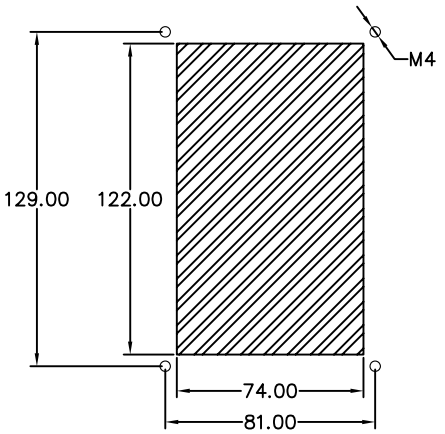
Paging may be performed in any of the three zones, or all zones.
Press the PTT key on the handheld microphone and speak clearly and directly into the microphone.
(The PTT button on the panel will not work properly with a handheld mic.)

AUTOMATIC AND MANUAL ZONE SELECTION.

The PA control unit, SPA 1506 has three zone keys plus one TALK/ALL key.
When one of the zone keys is activated, the indicator led illuminates full light.
If none of the zones is active (half-light), and the TALK/ALL key is operated, the system automatically goes into ALL CALL mode.
I.e. all the zone key indicator leds illuminates full light and the message is distributed in ALL ZONES.



CUT–OUT AND MOUNTING DIMENSIONS.



EQUIPMENT DATA:

MANUFACTURER	: JOTRON PHONTECH AS.	FIXING DETAILS	: 4pcs. M4 BOLT.
MODEL/TYPE	: CONTROL UNIT.	ACCESS	: REAR.
RACK/BOX SUPPL.	: JOTRON PHONTECH AS.	CABLE ENTRY	: REAR.
RACK/BOX TYPE	: CONSOLE MOUNTED.	GLAND TYPE	: NA.
MATERIAL	: ALUM./STEEL.	PROTECTION IP	: IP–22.
COLOUR	: RAL 9005/ALUM.	POWER SUPPLY	: FROM CENTRAL.
WEIGHT OF UNIT	: APP. 1,50Kg.	POWER CONSUMP.	: NA.
MOUNTING	: TO CONSOLE.	HEAT DISSIPATION	: NA.

REV No.	ISSUE DATE	REASON FOR ISSUE	PREPARED	CHECKED	APPROVED
01	19.05.2011	REVISION, EM 1383	ASK	TBA	ASK
0	03.09.2008	FINAL DOCUMENTATION	CD		ASk

TITLE: 1506 SPA CONTROL UNIT.
VERSION 05827.
MECHANICAL LAYOUT.

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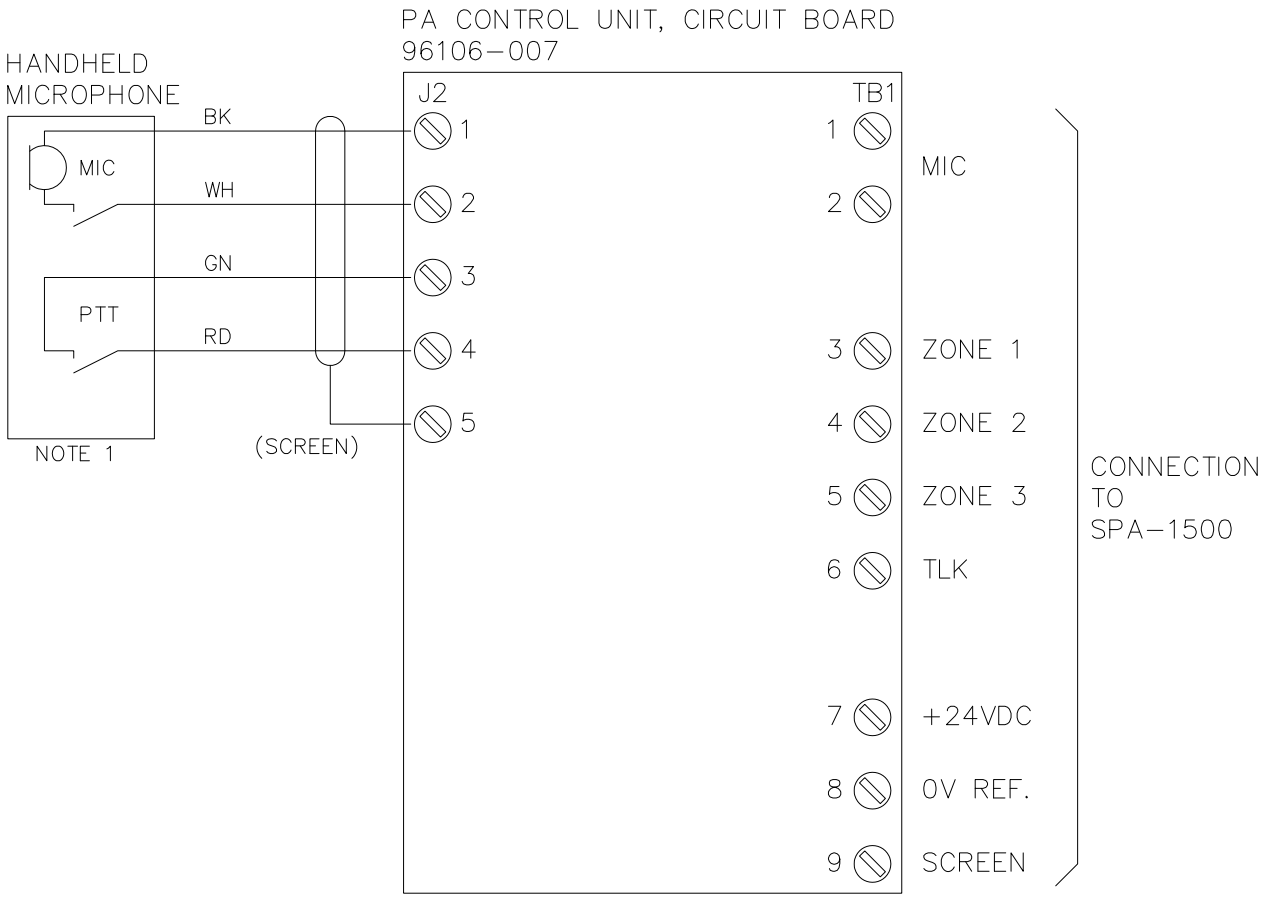
SIZE: A3	UED No:
DOC. No:	08100–002–ML
FILE NAME:	08100–002–ML.DWG



NOTE 1:

Brakett tapes fast på bakboks.

REV No.	ISSUE DATE	REASON FOR ISSUE	PREPARED	CHECKED	APPROVED
02	2007.05.11	REVISION EM–1096	AHJ	OT	TBH
01	2003.05.22	REVISION EM–951	R.F.	TBA	TØ
0	2001.11.15	FINAL DOCUMENTATION	R.F.	TBA	ASk

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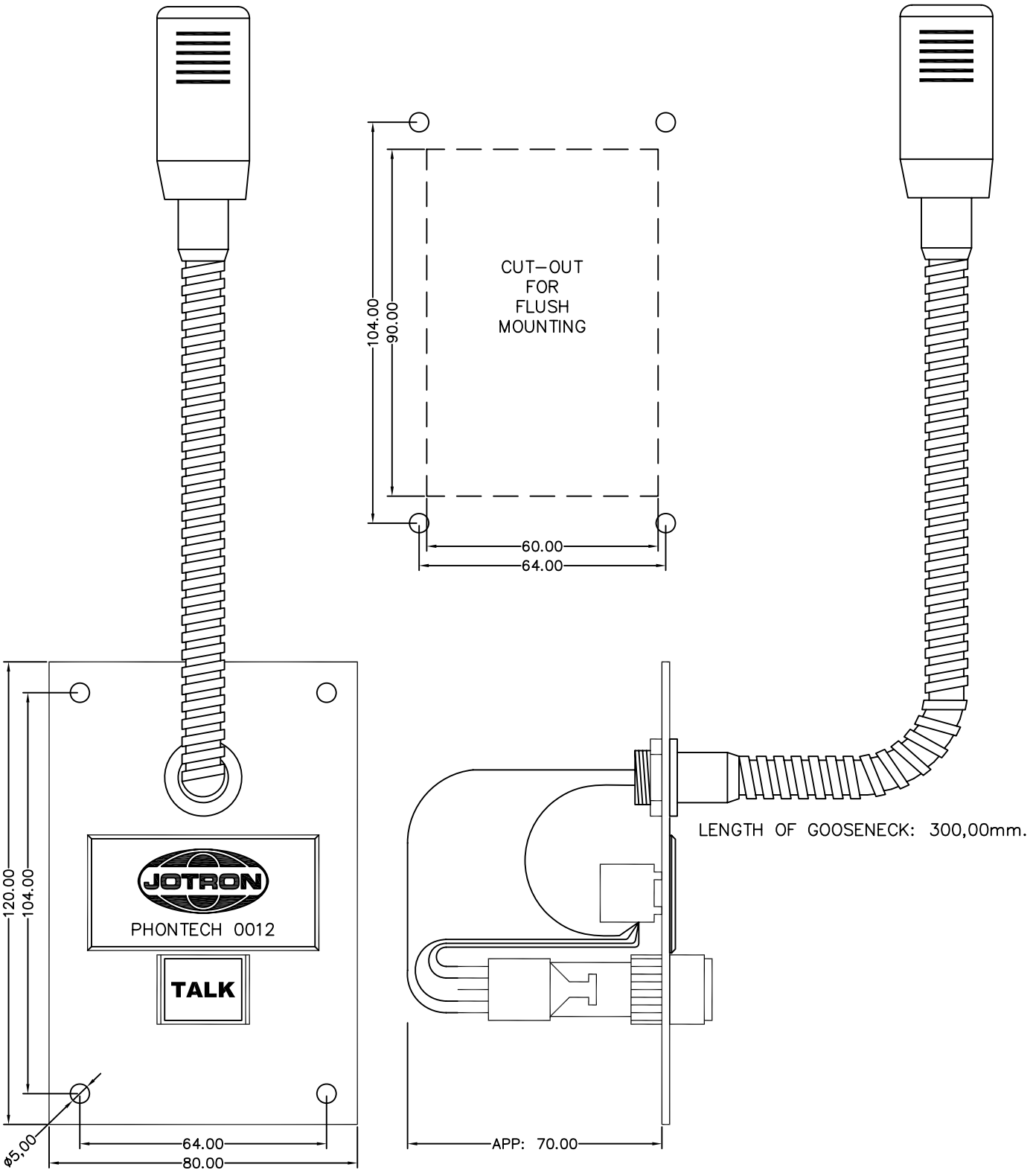
TITLE: PA CONTROL UNIT, 1506.
WITH HANDHELD MICROPHONE.
INTERNAL WIRING.

SIZE: A4

UED No: M025

DOC. No: 01100–003–IW

FILE NAME: 01100–003–IW.DWG



REV No.	ISSUE DATE	REASON FOR ISSUE	PREPARED	CHECKED	APPROVED
1	20.01.2011	Change Order No. 1347	R.F.	TBA	R.F.
0	92.05.13	AS BUILT.	R.F.	A.I.	JHB

TITLE: BRIDGE WING MIC UNIT, 0012.
WITH GOOSENECK.
MECHANICAL LAYOUT.

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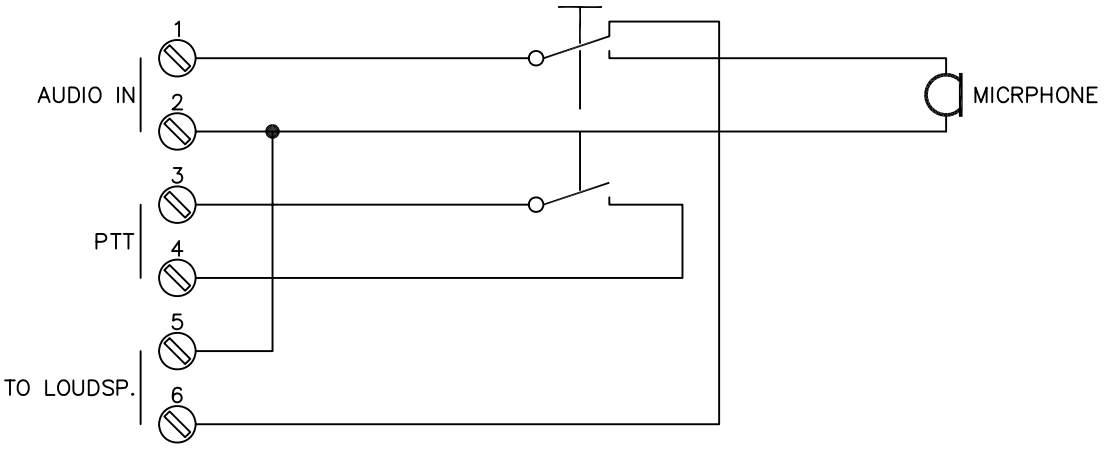
SIZE: A3
UED No:
DOC. No: 87000–035–ML
FILE NAME: 87000–035–ML.DWG



REV No.	ISSUE DATE	REASON FOR ISSUE	PREPARED	CHECKED	APPROVED
0	23.12.1987	AS BUILT.	R.F.	JHB	JHB

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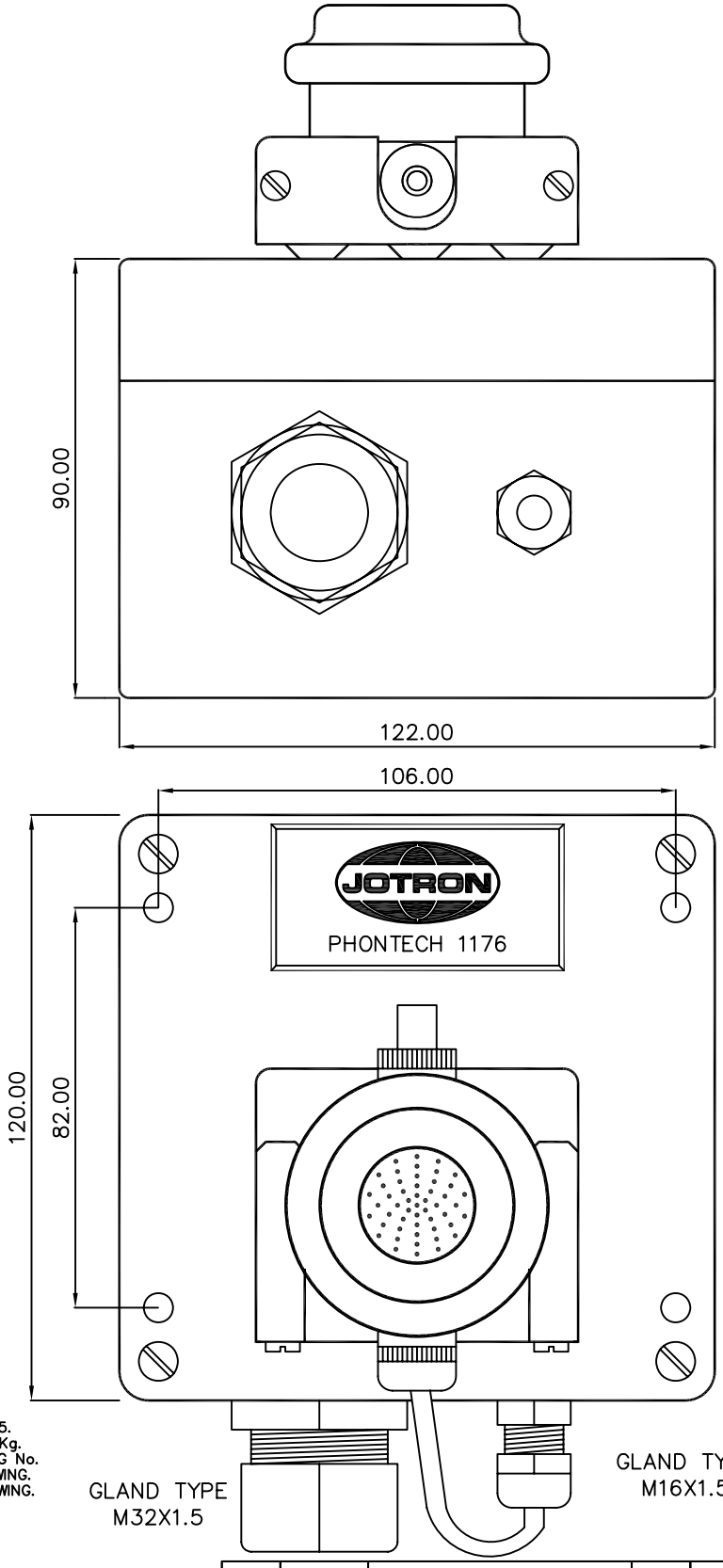
TITLE: BRIDGE WING MIC UNIT, 0012.
WITH GOOSENECK.
INTERNAL WIRING.

SIZE: A4	UED No:
DOC. No:	87000-035-IW
FILE NAME:	87000-035-IW.DWG



NOTES:
-MATERIAL: GRP.
-INGRESS PROTECTION: IP-65.
-WEIGHT OF UNIT: APP. 1,50Kg.
-FOR SPECIFICATION SEE DWG No.
93102-006-DD. DRILL DRAWING.
93102-006-LD. LABEL DRAWING.

REV No.	ISSUE DATE	REASON FOR ISSUE	PREPARED	CHECKED	APPROVED
2	2010.10.28	REVISION. EM 1320	ASK	TBA	ASK
1	2000.12.21	CHANGE ORDER No. 829	R.F.	A.I.	TBA
0	93.04.06	AS BUILT	R.F.	A.I.	TBA

TITLE: 1176, MICROPHONE UNIT, SINGLE SYSTEM
MECHANICAL LAYOUT.

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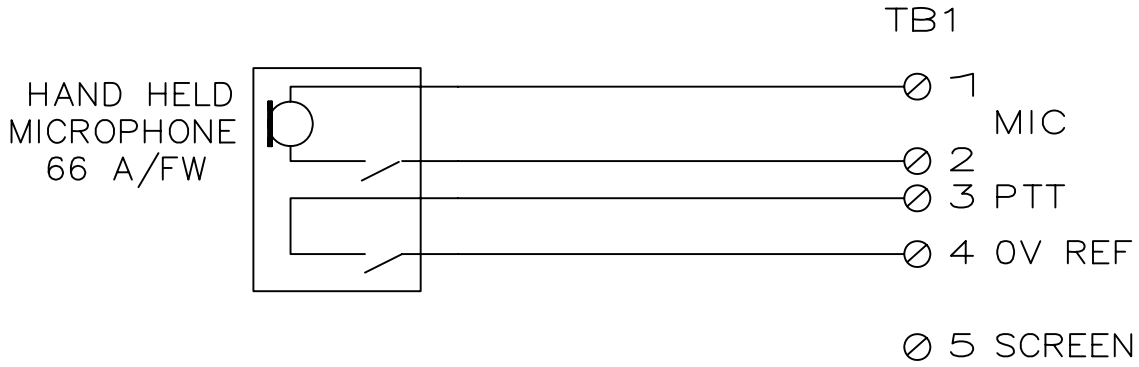
SIZE: A3
PAGE: 69
DRAWING No: 93102-006-ML
FILE NAME: 93102-006-ML.DWG



REV No.	ISSUE DATE	REASON FOR ISSUE	PREPARED	CHECKED	APPROVED
0	08.06.1993	AS BUILT.	R.F.	A.I.	A.I.

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TITLE: MICROPHONE STATION 1176.
INTERNAL WIRING.

SIZE: A4

UED No:

DOC. No: 93102-006-IW

FILE NAME: 93102-006-IW.DWG

Jotron AS
Jotron UK Ltd.
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Jotron Consultas AS
Jotron Asia Pte. Ltd.
Jotron USA, Inc.
UAB Jotron

Doc.No.: 96106-017-DE

PA ALARM PANEL
SPA-1503
DESCRIPTION

REV No:	ISSUE DATE	REASON FOR ISSUE	PREPARED	CHECKED	APPROVED
2	20.11.2009	REVISION, EM 1236	ASK	TBA	ASK
1	19.08.2009	REVISION, EM 1209	CD	TBA	CD
0	05021997	FINAL DOCUMENTATION	Tly	ASk	TBA

**TITLE: PUBLIC ADDRESS SYSTEM.
ALARM PANEL, SPA-1503.
DESCRIPTION.**

Jotron AS
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Jotron Phontech AS
Jotron Consultas AS
Jotron Asia Pte. Ltd.
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SIZE: A4	**UED no: 92**
DOC no: 96106-017-DE	
FILE NAME: 96106-017-DE.DOC	

GENERAL DESCRIPTION.

The SPA-1503 is the alarm panel in the SPA system.
The SPA-1503 is directly connected to the operation unit SPA-1500.
The SPA-1503 is normally connected to the general alarm input on the SPA-1500.
The SPA-1503 is designed for flush mounting.
To prevent starting the alarm unintended, the general alarm button is protected by a hinged cover.

POWER REQUIREMENTS:

Operating power: (light emitting diode power) 24 VDC.

CABLE REQUIREMENTS:

Number of pairs:	3
Conductor area (min) :	0.75 mm^2

MOUNTING:

SPA-1503 alarm panel is flush mounted in standardised dimension ship consoles.
For other flush mounting: cut-out dimensions is 34 x 123 mm.
Cable entry from behind.

ALARM CONTROL:

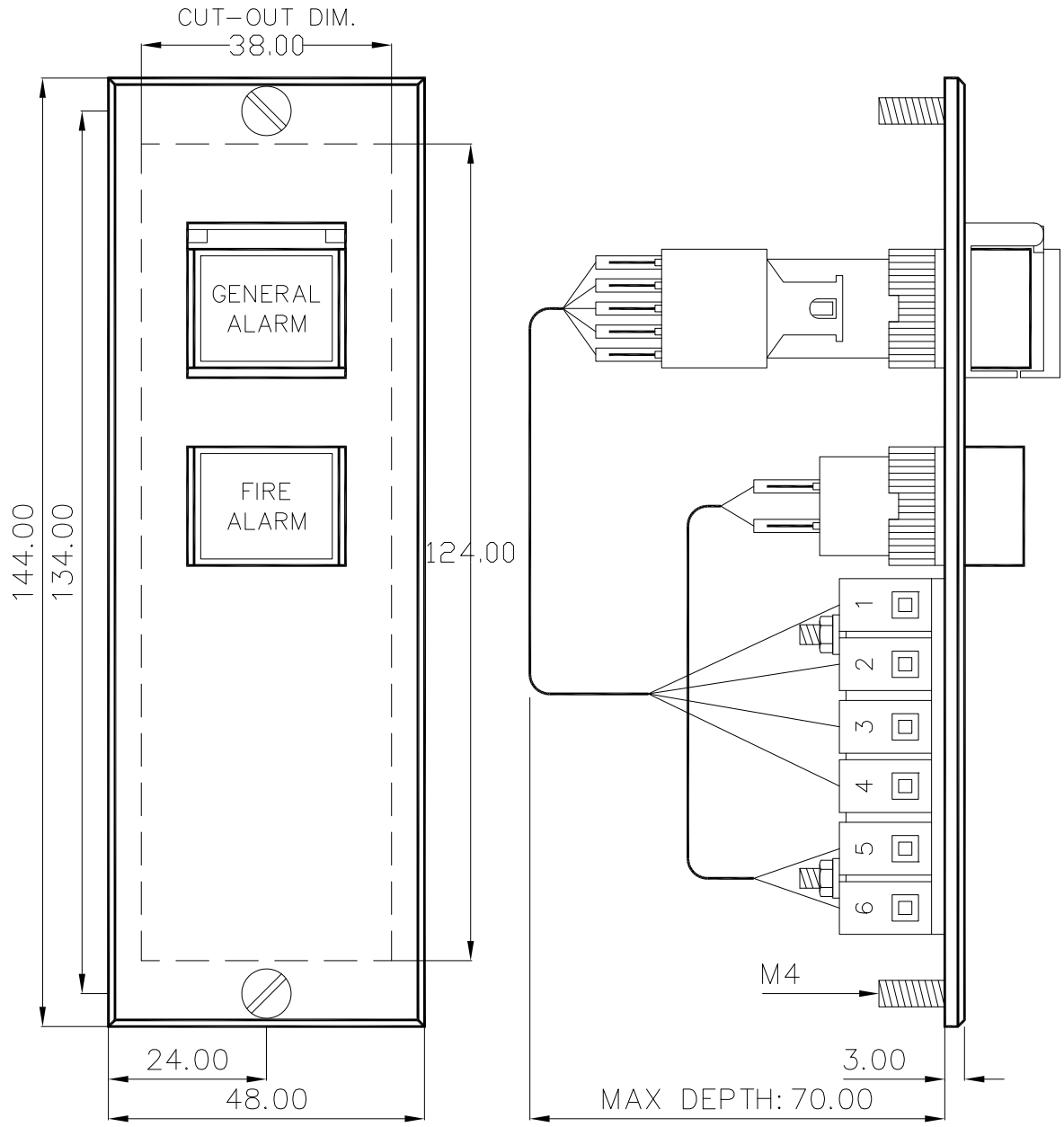
The alarm in the SPA system may be started/stopped automatically, or manually from the SPA-1503.
Only the GENERAL ALARM may be started from the SPA-1503, lamp indication for started alarm.
FIRE ALARM status may be monitored in the FIRE ALARM lamp.

SEVERAL ALARM PANELS IN THE SYSTEM:

If several SPA-1503 is to be incorporated in the system, the input “REMOTE INDICATOR GENERAL ALARM” may be utilised to obtain internal monitoring.
Half-light in the general lamp indicates that other alarm panel has started the alarm.

ALARM ZONES:

The SPA-1503 automatically distributes the alarm audio to all the zones.



NOTE:
- MATERIAL: ALUMINIUM.
- COLOUR: PAINTED BLACK. (RAL 9005).
- FOR FLUSHMOUNTING.

REV No.	ISSUE DATE	REASON FOR ISSUE	PREPARED	CHECKED	APPROVED
0	05.08.1997	AS BUILT.	R.F.	TLy	ASk

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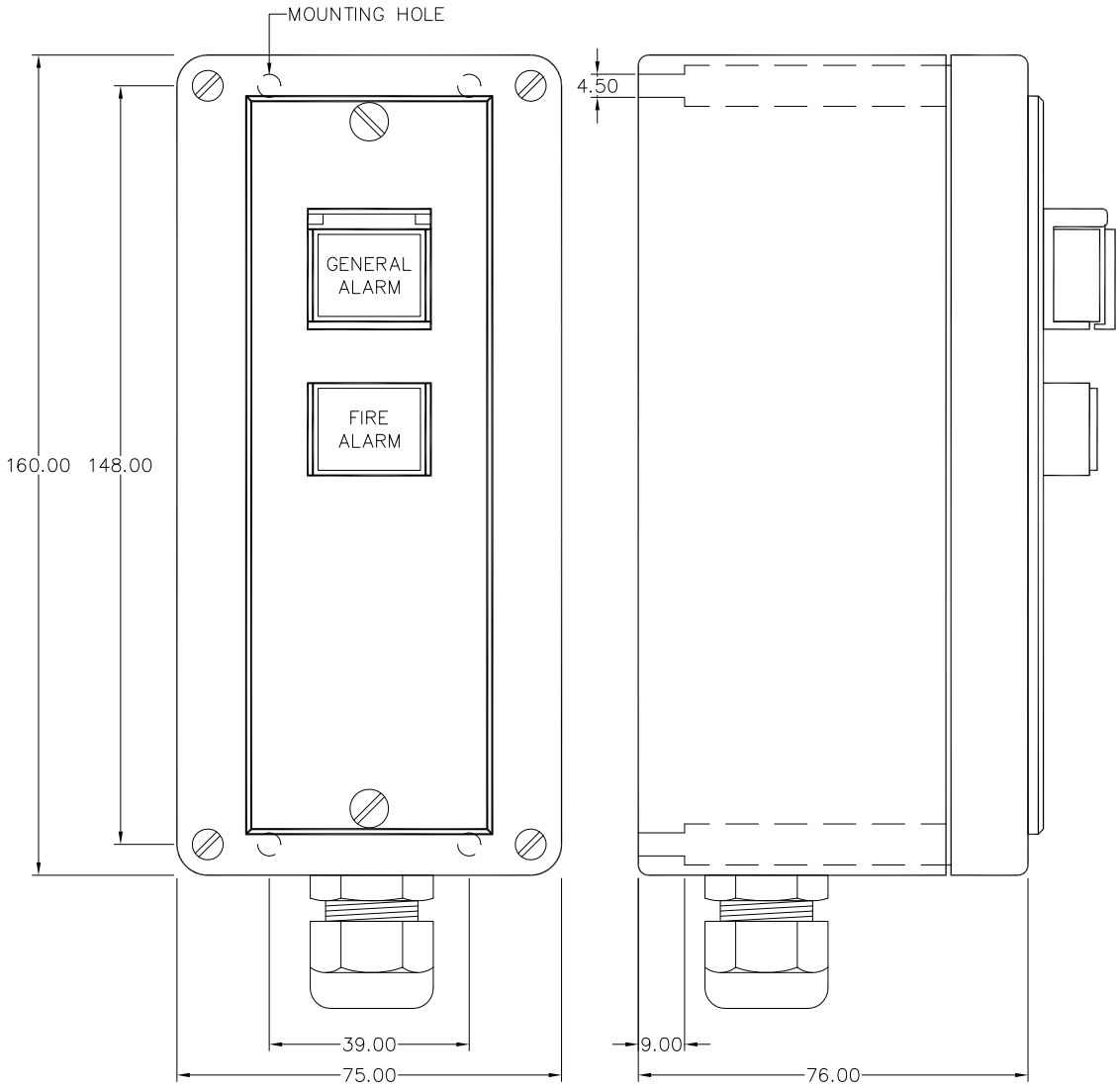
TITLE: PUBLIC ADDRESS SYSTEM.
ALARM PANEL, SPA-1503.
MECHANICAL LAYOUT.

SIZE: A4	UED No: 92
DOC. No: 96106-017-ML	
FILE NAME: 96106-017-ML.DWG	



EQUIPMENT DATA:

MANUFACTURER	: PHONTECH AS.	FIXING DETAILS	: 4pcs. M4 BOLT.
MODEL/TYPE	: ALARM PANEL.	ACCESS	: FRONT.
RACK/BOX SUPPL.	: BOPLA.	CABLE ENTRY	: BOTTOM.
RACK/BOX TYPE	: P-325.	GLAND TYPE	: PG-11.
MATERIAL	: GRP.	PROTECTION IP	: IP-20.
COLOUR	: RAL 7000.	POWER SUPPLY	: 24VDC.
WEIGHT OF UNIT	: APP. 1,00Kg.	POWER CONSUMP.	: NA.
MOUNTING	: TO WALL.	HEAT DISSIPATION	: NA.

REV No.	ISSUE DATE	REASON FOR ISSUE	PREPARED	CHECKED	APPROVED
A	2002.12.16	DEVELOPMENT.	R.F.	E.D.	ASk

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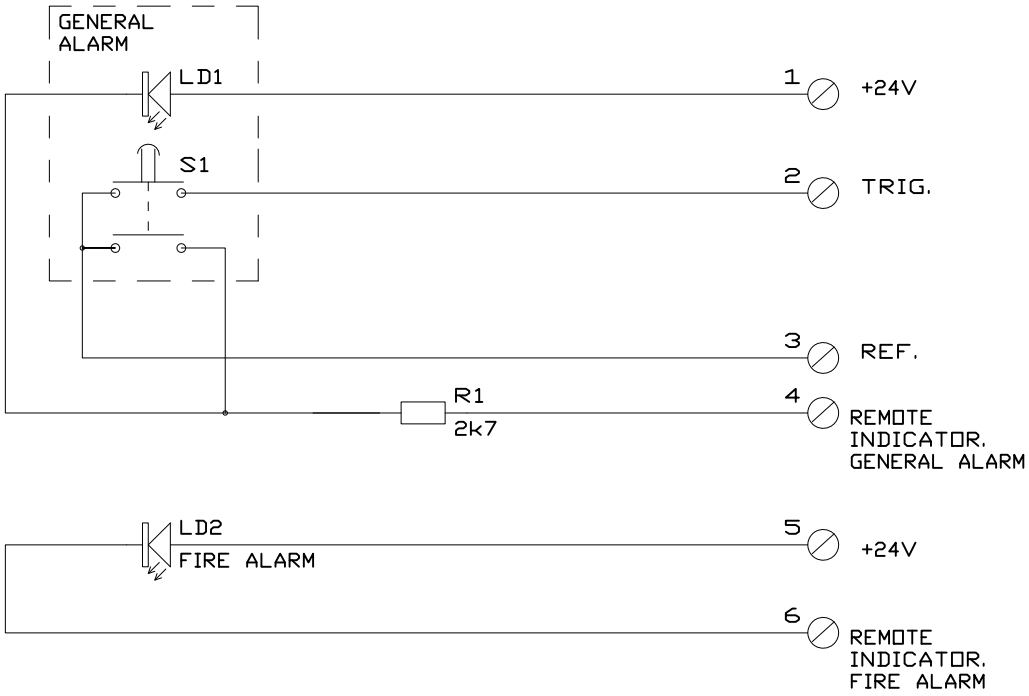
TITLE: SPA SYSTEM.
ALARM PANEL SPA 1503.
WALL MOUNTED.
MECHANICAL LAYOUT.

SIZE: A3 | UED No: 92

DOC. No: 96106-017-ML-01

FILE NAME: 96106-017-ML-01.DWG



REV No.	ISSUE DATE	REASON FOR ISSUE	PREPARED	CHECKED	APPROVED
0	05.06.1997	AS BUILT.	R.F.	TLy	ASk

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TITLE: PUBLIC ADDRESS SYSTEM.
ALARM PANEL, SPA-1503.
INTERNAL WIRING.

SIZE: A4

UED No: 92

DOC. No: 96106-017-IW

FILE NAME: 96106-017-IW.DWG

Jotron AS
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Jotron USA, Inc.
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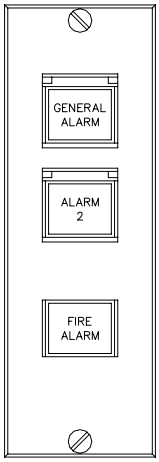
Doc.No.: 96106-019-DE

PA ALARM PANEL
SPA-1505
DESCRIPTION



REV No:	ISSUE DATE	REASON FOR ISSUE	PREPARED	CHECKED	APPROVED
1	19.08.2009	REVISION, EM 1209	CD	TBA	CD
0	23111999	FINAL DOCOMENTATION	Tly	A.I.	ASk

TITLE: PUBLIC ADDRESS SYSTEM.
ALARM PANEL, SPA-1505.
DESCRIPTION.

Jotron AS
Jotron UK Ltd.
Jotron Phontech AS
Jotron Consultas AS
Jotron Asia Pte. Ltd.
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SIZE: A4	**UED no: 92**
DOC no: 96106-019-DE	
FILE NAME: 96106-019-DE.DOC	

Jotron AS
Jotron UK Ltd.
Jotron Phontech AS
Jotron Consultas AS
Jotron Asia Pte. Ltd.
Jotron USA, Inc.
UAB Jotron

Doc.No.: 96106-019-DE

GENERAL DESCRIPTION.

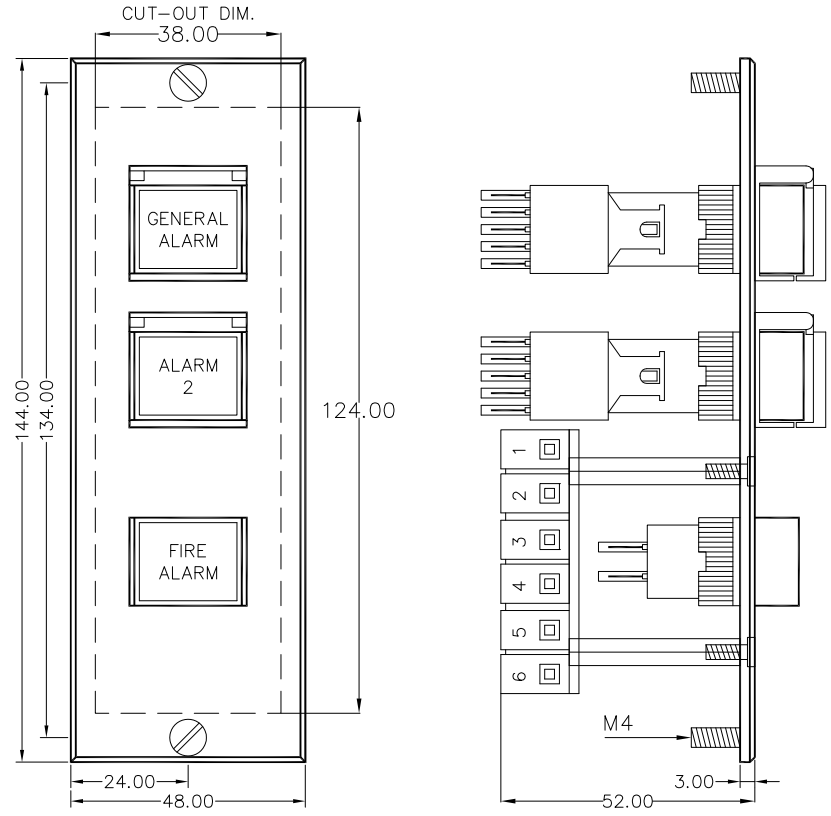
The alarm panel SPA-1505 is a panel intended for flush mounting either separately or in combination with the control unit SPA-1501. It is based on 144 mm standard module height, 48 mm wide.

The alarm panel consists of 2 alarm buttons with integrated light indicators and a third light indicator for a remote controlled alarm.
The alarm button indicators also have a remote control indication mode where they will light with reduced strength.
Then the alarm is overridden by own activation it will light with full intensity.
Both alarm buttons have mechanical alternate functionality. When connected to the SPA-1500 the termination will decide the priority of the alarm signal.

Phontech recommend the wiring indicated in the document 96106-019-EC.
This will make the priority according to IMO regulation like this:

1. General Alarm.
2. Fire alarm (remotely controlled from an automatic fire and gas system).
3. Alarm 2 (customer requirements/delivered upon request).

All alarm setting outputs and indicator inputs are based on 24 VDC supply with closing contacts to 0V.



NOTE:
-MATERIAL: ALUMINIUM.
-COLOUR: PAINTED BLACK. (RAL 9005).
-FOR FLUSHMOUNTING.

EQUIPMENT DATA.

MANUFACTURER	: PHONTECH AS.	FIXING DETAILS	: 2pcs. M4 BOLT.
MODEL/TYPE	: SPA 1505.	ACCESS	: NA.
RACK SUPPLYER	: PHONTECH AS.	CABLE ENTRY	: REAR.
RACK TYPE	: NA.	GLAND TYPE	: NA.
MATERIAL	: ALUMINIUM.	PROTECTION IP	: IP-20.
COLOUR	: BLACK RAL 9005.	POWER SUPPLY	: FROM MASTER STATION.
WEIGHT OF UNIT	: APP. 0,3Kg.	POWER CONSUMP.	: NA.
MOUNTING	: TO CONSOLE.	HEAT DISSIPATION	: NA.

REV No.	ISSUE DATE	REASON FOR ISSUE	PREPARED	CHECKED	APPROVED
0	04.03.1999	AS BUILT.	R.F.	A.I.	ASk

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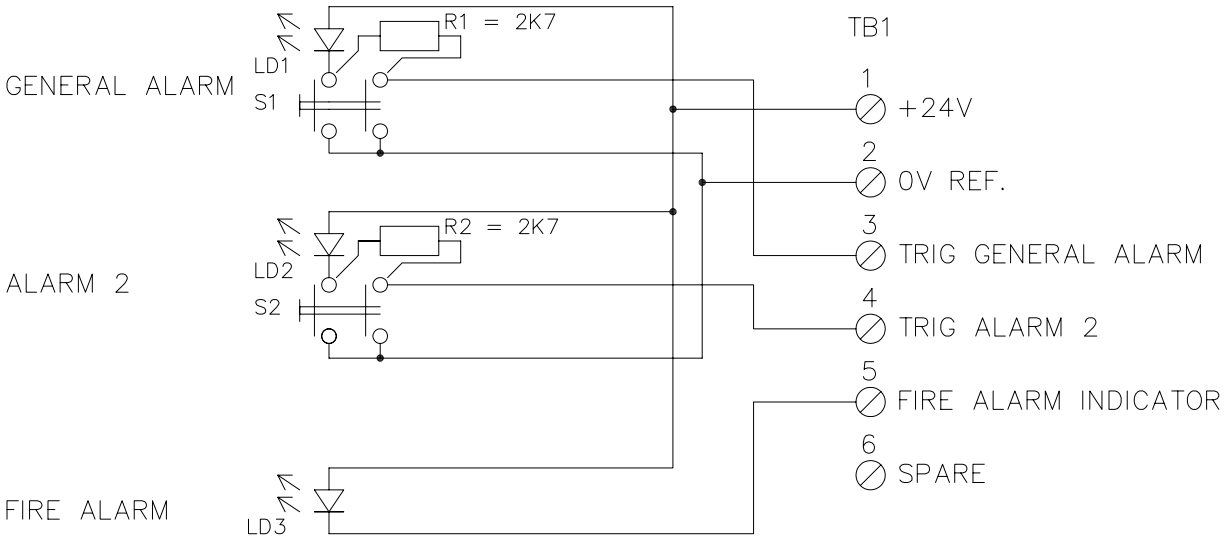
TITLE: ALARM PANEL SPA-1505.
MECHANICAL LAYOUT.

SIZE: A4
UED No: M003
DOC. No: 96106-019-ML
FILE NAME: 96106-019-ML.DWG



REV No.	ISSUE DATE	REASON FOR ISSUE	PREPARED	CHECKED	APPROVED
0	99.11.22	AS BUILT.	ASk	A.I.	ASk

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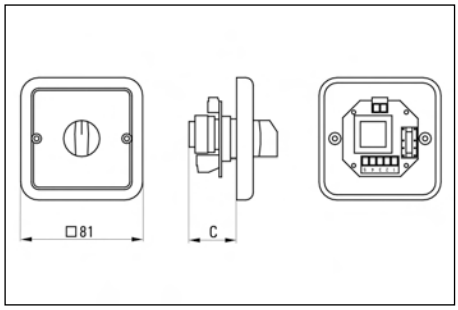
TITLE: ALARM PANEL SPA-1505.
INTERNAL WIRING.

SIZE: A4	UED No: M003
DOC. No:	96106-019-IW
FILE NAME:	96106-019-IW.DWG

LST 6 UP/AP, LST 50 UP/AP

100V volume control, suitable for offices, restaurants, shops, etc... The LST 6 and LST 50 UP/AP come with a rotary dial without limit stop and auto-transformer. Also available with an optional mandatory relay. The printed cover plate (included in the delivery) is screwed onto a standard flush-mounted box (42 mm in depth), or onto the 1x surface-mounted housing (LST 6 only). Both housings may also be supplied (depending on the version). A rotary knob is also included in the delivery.

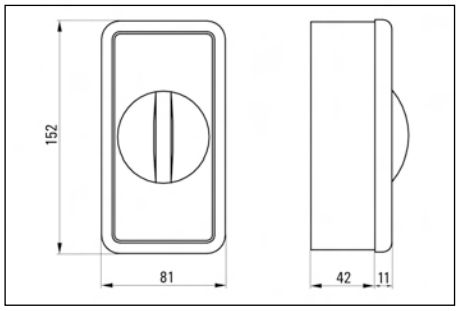


Technical Data	LST 6 UP/AP	LST 50 UP
Rated Power	6 W	50 W
Mandatory Relais Voltage	24 V	24 V
Mandatory Relais Current	0.012 A	0.012 A
Depth	35 mm	40 mm
Component Set	rotary switch without stopper, 9 volume levels, 3 off positions	rotary switch without stopper, 9 volume levels, 3 off positions
Net Weight	0.1 kg	0.18 kg
Colors	white (RAL 9010)	white (RAL 9010)
Accessories	incl. flush-/surface-mounted housing (depending on the version)	incl. flush-/surface-mounted housing (depending on the version)

W. Huber + Söhne GmbH + Co.KG · Bismarckstraße 19 · D-78652 Deißlingen/Germany
Tel. + 49 (0) 74 20 / 8 89 - 0 · Fax + 49 (0) 74 20 / 8 89 - 51 · www.whd.de

LST15 UP/AP, LST40 UP/AP, LST80 UP/AP

100V volume control, suitable for offices, restaurants, shops, etc... The LST 15-, 40- 80 UP/AP feature a rotary dial without limit stop and a auto-transformer and are also available with an optional mandatory relay. The printed cover plate (included in the delivery) is screwed on the 2x flush-mounted box (also supplied) or the 2x surface-mounted housing. A rotary knob is also included.



Technical Data	LST 15 UP/AP	LST40 UP/AP	LST 80 UP/AP
Rated Power	15 W	40 W	80 W
Mandatory Relais Voltage	24 V	24 V	24 V
Mandatory Relais Current	0.012 A	0.012 A	0.012 A
Depth	42 mm	42 mm	42 mm
Component Set	rotary switch without stopper, 9 volume levels, 3 off positions	rotary switch without stopper, 9 volume levels, 3 off positions	rotary switch without stopper, 9 volume levels, 3 off positions
Net Weight	0.27 kg	0.26 kg	0.39 kg
Colors	white (RAL 9010)	white (RAL 9010)	white (RAL 9010)
Accessories	incl. flush-/surface-mounted housing (depending on the version)	incl. flush-/surface-mounted housing (depending on the version)	incl. flush-/surface-mounted housing (depending on the version)

W. Huber + Söhne GmbH + Co.KG · Bismarckstraße 19 · D-78652 Deißlingen/Germany
Tel. + 49 (0) 74 20 / 8 89 - 0 · Fax + 49 (0) 74 20 / 8 89 - 51 · www.whd.de

DNH AS
N-3770 Kragerø
NORWAY
Phone: ..... (47) 35 98 56 00
Fax: ..... (47) 35 98 56 10
E-mail: ..... dnh@dnh.no
Web-site: ..... **www.dnh.no**

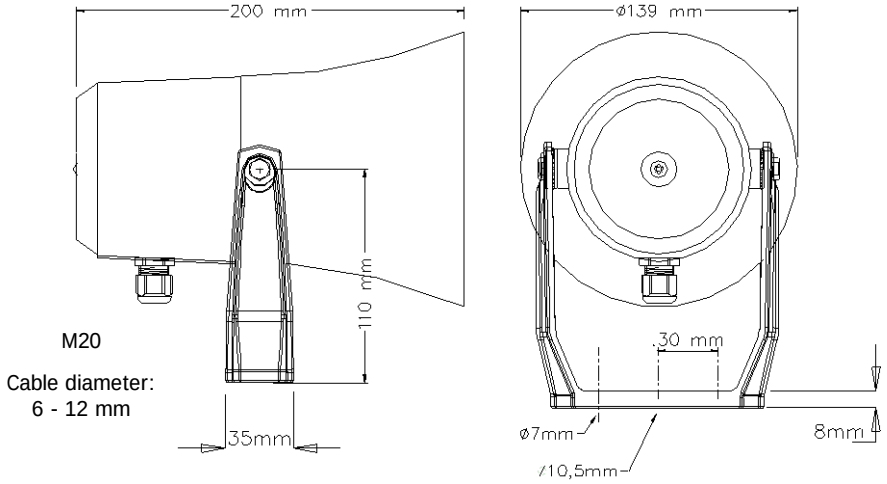
ISO 9001 CERTIFIED

DNH WW Ltd. Phone:....(44) 1908 275 000
England Fax:.....(44) 1908 275 100
E-mail:.....dnh@dnh.co.uk

DNH GmbH Phone:.....(49) 040 6569 30-0
Germany Fax:.....(49) 040 6569 30-30
E-mail:.....dnh@dnh.de

DNH Phone:.....(1) 484 494 5790
Speakers Inc. Fax:.....(1) 484 494 5793
USA E-mail:...dnh@dnhspeakers.com

HP-10(T)



70 V /100 V combined transformer:

Primary connection:
5 (White) :7 (Green) 70V
5 (White) : 8 (Red) 100 V

Secondary nominal tappings:
C : 4 10,0 W
C : 3 5,0 W
C : 2 2,0 W
C : 1 1,0 W

SPL @ different frequencies at 1W/1m sine wave.

Material / Color.....ASA / RAL 7035
Mounting .....Bracket
Termination.....Internal screw connections
Weight..... 1,3 kg
IP-rating (UL equivalent) 56
Max / min amb temp..... 90 °C / -50 °C
Rated / max. power .....10 W / 15 W
SPL 1W/1m ..... 106 dB
SPL rated power ..... 116 dB
Effective freq. range ..... 410 – 8000 Hz
Dispersion (-6dB) 1kHz / 4kHz .....150° / 45°
Directivity factor, Q (2kHz) 7,4
Options..... Impedances, colors, labels

Installation, Operation and Maintenance Procedures

- When mounting the loudspeaker please ensure that it is re-assembled in the same manner in which it was received. Fasten the bracket with 1-3 screws and ensure to use all washers in the intended position to assure the IP rating.
- To change the position of the loudspeaker, please adjust the bracket (by loosening / tightening the screws) as required.
- For optimum performance, always use the correct voltage / power and operate within the frequency limits as stated.
- Do not open loudspeaker when energized.
- Fasten lid with a torque of 1 - 2 Nm.
- This loudspeaker is supplied with a 2 year warranty against defective materials and workmanship.

HP-15(T)

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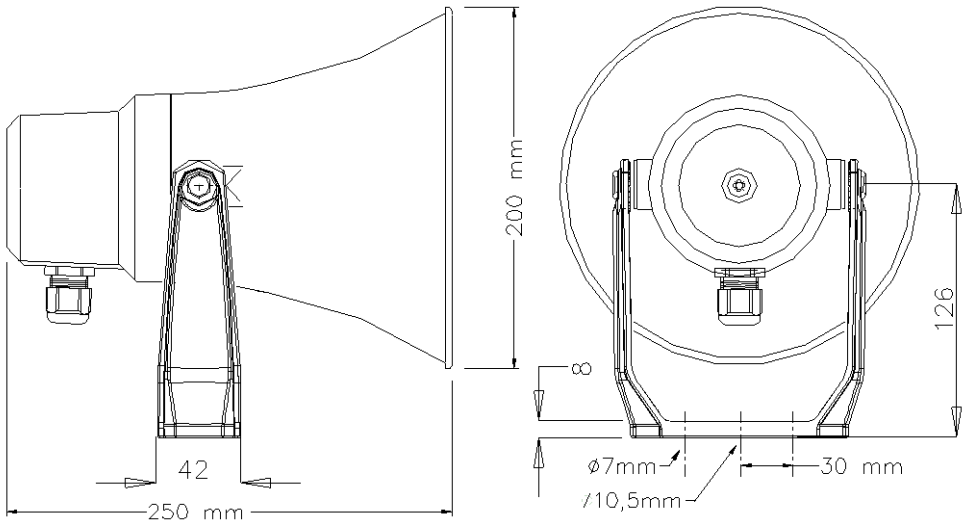
DNH AS
N-3770 Kragerø
NORWAY
Phone: .....(47) 35 98 56 00
Fax: .....(47) 35 98 56 10
E-mail: .....dnh@dnh.no
Web-site: ..... **www.dnh.no**

DNH WW Ltd. Phone:....(44) 1908 275 000
England Fax:.....(44) 1908 275 100
E-mail:.....dnh@dnh.co.uk

DNH GmbH Phone:.....(49) 040 6569 30-0
Germany Fax:.....(49) 040 6569 30-30
E-mail:.....dnh@dnh.de

DNH Phone:.....(1) 484 494 5790
Speakers Inc. Fax:.....(1) 484 494 5793
USA E-mail:...dnh@dnhspeakers.com

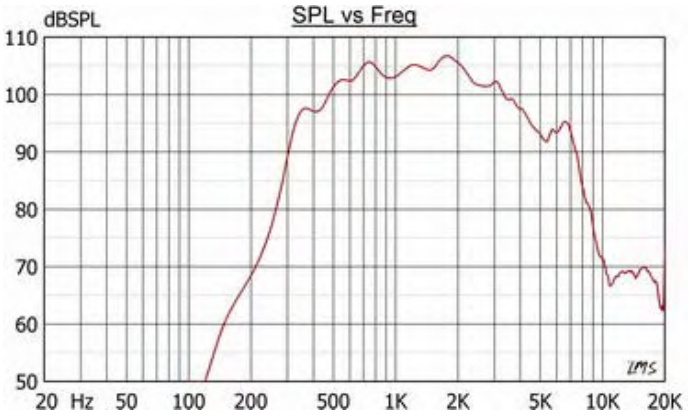


70/100 volt Combined Transformer:

Primary connections:
5 : 7 70 Volt line
5 : 8 100 Volt line

Secondary nominal tappings:
C : 4 15,0 W
C : 3 7,5 W
C : 2 4,0 W
C : 1 2,0 W

Sound pressure levels at different frequencies at 1W/1m sine wave



Material / Color	ASA / RAL 7035
Mounting	Bracket
Termination	Inside screw connections
Weight	1,5 kg
IP-rating	56
Max. / min. amb. temp	90 °C / -50 °C
Rated / max. power	15 W / 20 W
SPL 1W/1m	108 dB
SPL rated power	118 dB
Effective freq. range	330 – 8000 Hz
Dispersion (-6dB) 1kHz / 4kHz	130° / 35°
Directivity factor, Q (2kHz)	8,3
Options	Impedances, colors, labels

Installation, Operation and Maintenance Procedures

- When mounting the loudspeaker please ensure that it is re-assembled in the same manner in which it was received. Fasten the bracket with 2-3 screws .
- To change the position of the loudspeaker please adjust the bracket (by loosening / tightening the screws) as required.
- For optimum performance, always use the correct voltage / power and operate within the frequency limits as stated.
- Do not open loudspeaker when energized.
- Fasten lid with a torque of 1 - 2 Nm.
- This loudspeaker is supplied with a 2 year warranty against defective workmanship.

DNH reserves the right to alter specifications without notice. Rev.19.04.2010

DNH AS
N-3770 Kragerø
NORWAY
Phone: ..... (47) 35 98 56 00
Fax: ..... (47) 35 98 56 10
E-mail: ..... dnh@dnh.no
Web-site: ..... **www.dnh.no**

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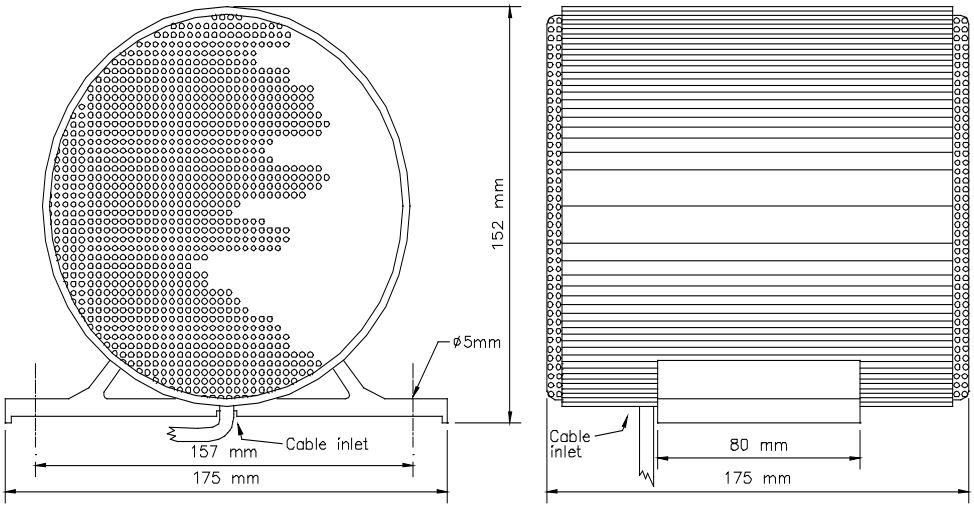
DNH WW Ltd. Phone:....(44) 1908 275 000
England Fax:.....(44) 1908 275 100
E-mail:.....dnh@dnh.co.uk

DNH GmbH Phone:.....(49) 040 6569 30-0
Germany Fax:.....(49) 040 6569 30-30
E-mail:.....dnh@dnh.de

DNH Speakers Inc. Phone:.....(1) 484 494 5790
USA Fax:.....(1) 484 494 5793
E-mail:...dnh@dnhspeakers.com

CAR-6(T)

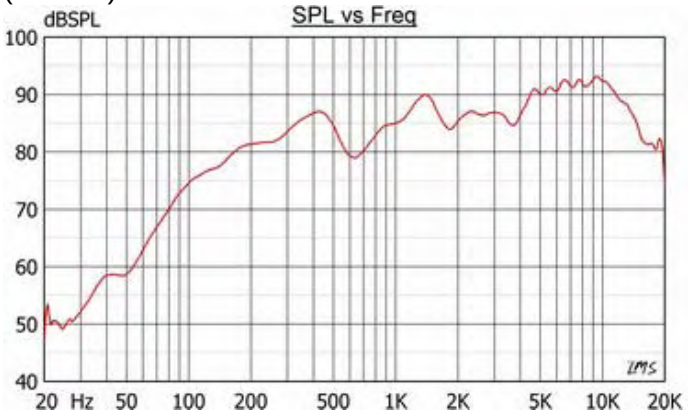


Transformer:
100 Volt line

Primary nominal tappings:

Black : Red	6,0 W
Black : Yellow	3,0 W
Black : Green	1,5 W
Black : Blue	0,5 W

SPL at different frequencies at1W/1m sine wave.
(P-5/15B)



Material / Colour ..... Aluminium / RAL9010 or anodized
Mounting..... Foot bracket
Termination.....Cable, 1m
Weight ..... 1,9 kg
Max. / min. amb. temp ..... 90 °C / -40 °C
Rated / max. power .....6 W / 10 W
SPL 1W/1m .....90 dB
SPL rated power .....96 dB
Effective freq. range.....150 – 20000 Hz
Dispersion (-6dB) 1kHz / 4kHz.....150° / 150°
Directivity factor, Q (2kHz).....14,6
Options.....Impedances, colors, labels

Installation, Operation and Maintenance Procedures

- Fasten loudspeaker with two screws through foot bracket.
- For optimum performance, always use the correct voltage / power and operate within the frequency limits as stated.
- This loudspeaker is supplied with a 2 year warranty against defective workmanship.

DNH reserves the right to alter specifications without notice. Rev. 10.08.2010

BF-560(T)

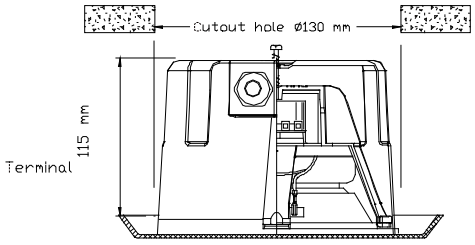
ISO 9001 CERTIFIED

DNH AS
N-3770 Kragerø
NORWAY
Phone: .....(47) 35 98 56 00
Fax: .....(47) 35 98 56 10
E-mail: .....dnh@dnh.no
Web-site: ..... **www.dnh.no**

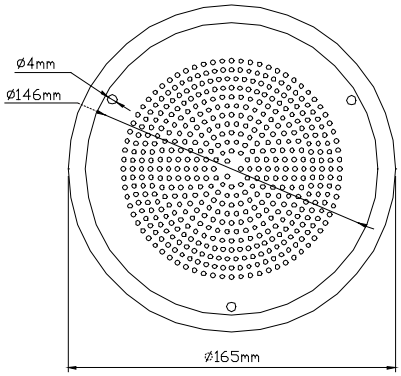
DNH WW Ltd. Phone:....(44) 1908 275 000
England Fax:.....(44) 1908 275 100
E-mail:.....dnh@dnh.co.uk

DNH GmbH Phone:.....(49) 040 6569 30-0
Germany Fax:.....(49) 040 6569 30-30
E-mail:.....dnh@dnh.de

DNH Phone:.....(1) 484 494 5790
Speakers Inc. Fax:.....(1) 484 494 5793
USA E-mail:...dnh@dnhspeakers.com



M20 cable gland and M20 blinding plug



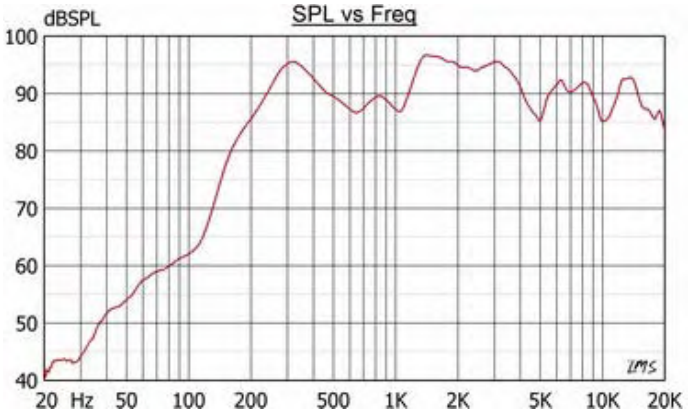
Transformer:
Combined
70/100Volt line

White : Red	100 V
White : Green	70 V

Secondary nominal tappings:

C : 6	6,0 W
C : 3	3,0 W
C : 1,5	1,5 W
C : 0,5	0.5 W

Sound pressure levels at different frequencies at 1W/1m sine wave.



Material / Color	Aluminum / RAL9010
Mounting	3 screws
Termination	Spring clamps
Weight	0,8 kg
IP-rating	
Max / min amb temp	90°C / -20°C
Rated / max power	6 W / 15 W
SPL 1W/1m	90 dB
SPL rated power	97 dB
Effective freq range	150 – 20000 Hz
Dispersion (-6dB) 1kHz / 4kHz	170° / 60°
Directivity factor, Q	
Options	Impedance, color, label

Installation, Operation and Maintenance Procedures

- Lead cable trough cable inlet in to box and connect to terminal.
- Install box onto loudspeaker and fit complete loudspeaker into ceiling by 3 screws.
- The material of the plastic box is V0 and free of halogen.
- For optimum performance, always use the correct voltage / power and operate within the frequency limits as stated.
- Do not open loudspeaker when energized.
- This loudspeaker is supplied with a 2 year warranty against defective materials and workmanship.

DNH reserves the right to alter specifications without notice. Rev. 28.10.2008

Jotron AS
Jotron UK Ltd.
Jotron Phontech AS
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